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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	09/586,722
Filing Date	June 5, 2000
First Named Inventor	Robert I. G. McLEAN
Art Unit	3623
Examiner Name	Tarae, C. Michelle
Attorney Docket Number	350725-991110

ENCLOSURES *(Check all that apply)*

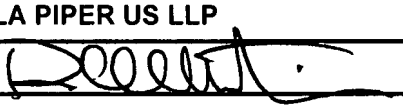
- ☒ Fee Transmittal Form
  - ☒ Fee Attached
- ☐ Amendment/Reply to OA
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Replacement Drawing(s
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☒ Appeal Communication to TC (Appeal Notice, **Appeal Brief (25 pages)** Reply Brief)
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) (please Identify below):

1. Exhibit A; Declaration in support of an Appeal Brief; and
2. Return addressed postcard.

Remarks

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. 07-1896 (**Docket No. 350725-991110**

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	**DLA PIPER US LLP**		
Signature			
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Date	May 25, 2007	Reg. No.	43,465

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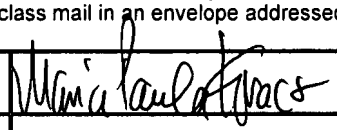
Signature			
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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2007

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 250.00

Complete If Known	
Application Number	09/586,722
Filing Date	June 5, 2000
First Named Inventor	Robert I. G. McLEAN
Examiner Name	Tarae, C. Michelle
Art Unit	3623
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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
		Small Entity		Small Entity		Small Entity	
Application Type	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		Extra Claims		Fee ($)		Fees Paid ($)
_____	- 20 or HP =	_____	x	_____	=	_____

HP = highest number of total claims paid for, if greater than 20

Indep. Claims		Extra Claims		Fee ($)		Fees Paid ($)
_____	- 3 or HP =	_____	x	_____	=	_____

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims	
Fee ($)	Fee Paid ($)
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof		Fee ($)		Fee Paid ($)
_____	- 100 =	_____	/50=	_____	(round up to a whole number) x	_____	=	_____

4. OTHER FEE(S)

	Fee Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge): 2402 41.20(b)(2) Filing a brief in support of an appeal (sm. entity)	250.00

SUBMITTED BY

Signature	[signature]	Registration No. (Attorney/Agent) 43,465	Telephone 650.833.2052
Name (Print/Type)	DAVID L. ALBERTI		Date May 25 2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of Robert I.G. MCLEAN, et al.

Application No. 09/586,722

Attorney Docket No. 350725-991110

Filed: June 5, 2000

For: DATA PROCESSING SYSTEM AND METHOD THAT PROVIDES AN INTEGRATED AND COMPREHENSIVE USER INTERFACE FOR ANALYSIS OF VALUE CREATION PERFORMANCE OF A BUSINESS ENTERPRISE

Group Art Unit: 3623

Examiner: Tarae, C. Michelle

APPEAL BRIEF

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May 25, 2007

Maria Paula Kovacs

Dear Sir/Madam:

This is a brief for an appeal filed in response to a final Office action dated January 31, 2007, and from a Notice of Appeal that was filed on April 16, 2007.

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TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee of this application, the Canadian Institute of Chartered Accountants.

II. RELATED APPEALS AND INTERFERENCES

As of the date of this appeal brief, there is an appeal brief pending in a related application: Application No. 09/574,569. The present application is a continuation-in-part of the '569 application. The Board has not rendered a decision in that appeal. The Examiner for the '569 application has not yet responded to that appeal brief.

III. STATUS OF THE CLAIMS

The application was originally filed with claims 1-22. Claims 6-7 and 19-20 have been cancelled. Claims 1-5, 8-18, and 21-22 remain pending and stand rejected. This is an appeal of rejected claims 1-5, 8-18, and 21-22. Claims 1-5, 8-18, and 21-22 are reproduced and attached in the Claims Appendix.

IV. STATUS OF AMENDMENTS

All offered amendments have been entered. The claims appear before the Board as they were finally rejected (claims 1-5, 8-18, and 21-22) and are attached in the Claims Appendix.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 recites a method of processing data relating to the performance of a business enterprise in creating value in which a data structure is developed including assumed variables that have an influence on a value stream of the business enterprise. *See, e.g., Appellant's Specification as filed at p. 4, ll. 4-7.* The assumed variables are arranged in a multi-level hierarchy in which assumed variables positioned at a lower level in the hierarchy influence one or more assumed variables positioned at a higher level in the hierarchy. *See, e.g., id. at p. 4, ll. 7-9.* A first outcome is determined for the financial value stream of the business enterprise based upon the assumed variables. *See, e.g., id. at p. 4, ll. 9-10.* A user is authorized to alter one or more of the assumed variables according to a level of the hierarchy in which the assumed

variables are positioned. *See, e.g., id. at p. 4, ll. 10-12.* A second outcome for the value stream of the business enterprise is determined by taking into account the altered assumed variables. *See, e.g., id. at p. 4, ll. 12-13.*

Claim 5 recites a method of processing data relating to the performance of a business enterprise in creating value in which a data structure is developed including a plurality of assumed variables that have an influence on a value stream of the business enterprise. *See, e.g., Appellant's Specification as filed at p. 4, ll. 28-31.* The data structure has a portion which defines a base case scenario for the business enterprise. *See, e.g., id. at p. 4, l. 31 - p. 5, l. 1.* An outcome is determined for the value stream of the business enterprise based upon the assumed variables of the base case scenario. *See, e.g., id. at p. 5, ll. 1-2.* A plurality of users alter selected ones of the plurality of assumed variables. *See, e.g., id. at p. 5, ll. 2-3.* Each altered assumed variable is stored in the data structure in association with an identifier of the user who made the alteration. *See, e.g., id. at p. 5, ll. 3-4.* The assumed variables of the base case scenario are maintained unchanged by the plurality of users. *See, e.g., id. at p. 5, ll. 4-5.* Selected ones of the altered assumed variables and selected ones of the assumed variables of the base case scenario are aggregated in accordance with the stored identifiers to form one or more alternate scenarios. *See, e.g., id. at p. 5, ll. 6-8.* An outcome is determined for the value stream of the business enterprise based upon each of the alternate scenarios. *See, e.g., id. at p. 5, ll. 8-9.*

Claim 10 recites a method of processing data relating to the performance of a business enterprise in creating value in which a data structure is developed including a plurality of assumed variables that have an influence on a value stream of the business enterprise. *See, e.g., Appellant's Specification as filed at p. 4, ll. 14-17.* The data structure has a portion which defines a base case scenario for the business enterprise. *See, e.g., id. at p. 4, ll. 17-18.* An outcome is determined for the value stream of the business enterprise based upon the assumed variables of the base case scenario. *See, e.g., id. at p. 4, ll. 18-19.* Real-time feedback is provided by each of a plurality of users on the value creation performance of the business enterprise. *See, e.g., id. at p. 4, ll. 19-21.* The real-time feedback is stored in the data structure in association with an identifier of the user who provided each portion of the feedback. *See, e.g., id. at p. 4, ll. 21-22.* The assumed variables of the base case scenario are maintained unchanged by the plurality of users. *See, e.g., id. at p. 4, ll. 22-23.* Selected ones of the portions of the feedback and selected ones of the assumed variables of the base case scenario are aggregated.

See, e.g., id. at p. 4, ll. 23-24. An outcome for the value stream of the business enterprise is determined based upon the selected ones of the portions of the feedback and the selected ones of the assumed variables of the base case scenario. *See, e.g., id. at p. 4, ll. 25-27.*

Claim 14 recites a system for processing data relating to the performance of a business enterprise in creating value in which a memory device stores a data structure including assumed variables that have an influence on a value stream of the business enterprise. *See, e.g., Appellant's Specification as filed at p. 5, ll. 10-13.* The assumed variables in said data structure are arranged in a multi-level hierarchy in which assumed variables positioned at a lower level in the hierarchy influence one or more assumed variables positioned at a higher level in the hierarchy. *See, e.g., id. at p. 5, ll. 13-15.* A user is authorized to alter one or more of the assumed variables according to a level of the hierarchy in which the assumed variables are positioned. *See, e.g., id. at p. 5, ll. 15-17.* A filter selects certain ones of the assumed variables and certain ones of the altered assumed variables. *See, e.g., id. at p. 5, ll. 17-18.* A calculation engine for receiving the certain ones of the assumed variables and the certain ones of the altered assumed variables from the filter and for determining an outcome for the financial value stream of the business enterprise based upon the certain ones of the assumed variables and the certain ones of the altered assumed variables. *See, e.g., id. at p. 5, ll. 18-21.*

Claim 18 recites a method of processing data relating to the performance of a business enterprise in creating value in which a data structure is developed including a plurality of assumed variables that have an influence on a value stream of the business enterprise and at least one future or past event for each assumed variable that influences the corresponding assumed variable. *See, e.g., Appellant's Specification as filed at p. 5, ll. 22-26.* The data structure has a portion that defines a base case scenario for the business enterprise. *See, e.g., id. at p. 5, ll.26-27.* An outcome is determined for the value stream of the business enterprise based upon the assumed variables and events of the base case scenario. *See, e.g., id. at p. 5, ll. 27-28.* Selected ones of the plurality of assumed variables and selected ones of the events are altered by a plurality of users. *See, e.g., id. at p. 5, ll. 29-30.* Each altered assumed variable and each altered event is stored in the data structure in association with an identifier of the user who made the alteration. *See, e.g., id. at p. 5, ll. 30-31.* The assumed variables and events of the base case scenario are maintained unchanged by the plurality of users. *See, e.g., id. at p. 5, l. 31 - p. 6, l. 1.* Selected ones of the altered assumed variables and events are aggregated along with selected

ones of the assumed variables and events of the base case scenario in accordance with the stored identifiers to form one or more alternate scenarios. *See, e.g., id. at p. 6, ll. 2-4.* An outcome is determined for the value stream of the business enterprise based upon each of the alternate scenarios. *See, e.g., id. at p. 6, ll. 4-5.*

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are as follows:

1) Claims 1-5, 8-18, and 21-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,321,205 to Eder, in view of U.S. Patent No. 6,944,777 to Belani, et al.

VII. APPELLANT'S ARGUMENT

A. Claims 1-5, 8-18, and 21-22 are patentable over the combination of Eder and Belani.

The Examiner has rejected claims 1-5, 8-18, and 21-22 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,321,205 to Eder ("Eder"), in view of U.S. Patent No. 6,944,777 to Belani, et al. ("Belani"). *Office Action of Jan. 31, 2007 at p. 5.*

The Board should overturn these rejections because neither Eder nor Belani, either alone or in combination, teach or suggest every element recited in each of the claims, and because the combination of Eder and Belani produces a system that is fatally flawed.

1. The Patent and Trademark Office has already conceded that Eder bears little relation to the subject matter of the present application.

The present application is a continuation-in-part of U.S. Application Serial No. 09/574,569 ("the '569 application"), filed May 17, 2000, and entitled "CONTINUOUSLY UPDATED DATA PROCESSING SYSTEM FOR MEASURING FINANCIAL VALUE CREATION." Both applications have similar specifications and claims that share certain similar limitations. The Examiner of the '569 application also relied on Eder as the primary reference to reject that application's claims under § 103(a). *See, e.g., Evidence Appendix, Ex. A, Declaration of David L. Alberti in support of Appellant's Appeal Brief ("Alberti Decl."), at ¶ 1, Ex. 1 (Office Action of April 7, 2006), at p. 2.* In response, Appellant explained in an appeal brief that Eder is deficient in a variety of ways – Eder does not deal with future financial value streams as defined

in that application, Eder does not analyze individual value streams, and Eder does not disclose the claimed method of determining the present value of future value streams. *See Alberti Decl. at ¶ 2, Ex. 2 (Appeal Brief of October 16, 2006), at pp. 11-16.* In light of these arguments, the Examiner of the '569 application withdrew all rejections based on Eder, re-opened prosecution, and relied on different references for his next rejection.[1] *See Alberti Decl. at ¶ 3, Ex. 3 (Office Action of January 24, 2007), at pp. 2, 6.* In short, the Examiner conceded that Eder bears little relation to the '569 application. Because the claims of present application include similar limitations against which Eder was cited in the '569 application, Eder also bears little relation to the pending claims for the same reasons.

2. Eder and the present invention solve different problems and do so using different methods.

Eder and the present invention both refer to certain deficiencies of traditional financial accounting and reporting. Although both Eder and the present invention use certain financial techniques, they solve different problems and use fundamentally different methods to do so.

The essential problem that Eder attempts to solve is incorporating intangible assets into business valuation. Eder proposes methods by which enterprise value can be calculated based on a combination of current asset values, value for current business operations, and future growth. *Eder at 6:15-25.* Eder describes methods by which the components used to calculate the value for current business operations – revenue, expense, and capital – can be related to intangible "elements of value," such as brand names, a customer base, employees, strategic alliances, vendors, etc. More generally, Eder describes a system which enables a user to model how various "value drivers" influence the value of a business as determined by a combination of conventional business valuation techniques.

In contrast to Eder, the present invention is not concerned with the valuation of intangible assets and, although computations used in the present invention could indeed be used in the process of business valuation, their main purpose is not business valuation at a point in time but the measurement of value creation over time. The present invention describes a new approach to measuring business performance which is based not on past transactions (as in traditional accounting), but on modeling the potential of a business to create value in the future. The

[1] Applicant asserts that the new references cited in the '569 application are even less relevant than Eder and has

present invention focuses on explicit assumptions as to the future, with each assumption tied to future and past events, and with the assumptions changing over time as events occur.

One issue considered in the design of the present invention is the credibility of the assumptions and events that are used to assess the value creation potential of the value streams of a business enterprise. The present system is designed so that users can examine for themselves the assumptions and events that are used to assess this value creation potential.

The present invention accomplishes this transparency while still providing for commercial confidentiality by:

- Placing all assumptions and events in a multi-level hierarchy;

- Creating a user authorization system that defines at what level in the multi-level hierarchy each user is permitted to access and alter variables; and

- Selectively authorizing users to view the combined effect of designated users' or groups' (pluralities of users) altered variables.

As discussed below, Eder does not disclose any of these methods for enabling users to interact with and gain confidence in the assumptions and events in the model. Nor does Eder disclose more fundamental aspects of the present invention, such as financial value streams.

3. Eder does not disclose the financial value streams of the present invention.

Each of the present application's independent claims include limitations regarding the determination of the outcome of a *value stream* for a business enterprise.[2] In the January 31, 2007 Office Action, the Examiner relates the value streams of the present invention to the "current-operation value" in Eder (page 6, lines 5-7 "The component values are calculated to determine the operation value"). But there is no basis in Eder to associate the current-operation

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concurrently appealed that rejection.

[2] *See, e.g.,* claim 1: "determining, by use of the computer system, a first outcome for the value stream of the business enterprise ..."; claim 5: "determining, by use of a computer system, an outcome for the value stream of the business enterprise ..."; claim 10: "determining, by use of a computer system, an outcome for the value stream of the business enterprise ..."; claim 14: "determining an outcome for the financial value stream of the business enterprise ..."; and claim 18: "determining, by use of the computer system, an outcome for the value stream of the business enterprise ...."

value with financial value streams. Indeed, Eder shows that these two concepts are quite different, and the Examiner has not cited any evidence that shows otherwise.

The present invention focuses on the analysis of value streams. A value stream for a business enterprise is defined in the present specification as "an aggregation of financial and non-financial benefits flowing to the business and arising from a minimum set of activities that are necessary to give rise to the benefits." *Appellant's Specification as filed at p. 9, ll. 4-6.* The present specification points out that value streams can be historical or future, and financial or non-financial. *Id. at p. 9, ll. 6-13.*

As an example of how a value stream works in the present invention, consider an individual drug that forms part of the portfolio of a pharmaceutical company. The value stream associated with that specific drug can be modeled as a stream of financial benefits flowing to the organization over time. In addition, if the drug happened to be a cure for cancer, there could also be non-financial benefits, such as enhancement of the company's reputation. In both cases, the value streams could be related to a minimum set of activities required to give rise to the benefits: in this case, the company's development and promotional activities related to the specific drug. A model according to the present invention for such a pharmaceutical company would be concerned with analyzing the value streams associated with each individual drug in the company's portfolio.

The current-operation value in Eder, by contrast, is different in several ways. Eder defines the current-operation value as the sum of: 1) the value of expected revenue from the current operation; 2) the value of the expected expense for the current operation; and 3) the value of capital required to support the current operation. *Eder at 11:5-17.* This formula alone shows that the current-operation value in Eder is fundamentally different than the value stream of the present invention ("an aggregation of financial and non-financial benefits flowing to the business"). Of the three components that make up the current-operation value – revenue, expense, and capital – only revenue can qualify as a "benefit" that flows to a business. Expenses are the opposite of a benefit, and the capital required to support an operation is just another form of expense. But the revenue value is just one component, i.e. a single benefit, it is not "an aggregation" of benefits and therefore cannot make up a value stream. And the revenue value cannot be said to represent an aggregation of sub-component benefits because "the revenue value

is not subdivided." *Id. at 11:25-26; see also 19:18-19 "there is only one revenue component per enterprise;" 19:21-22 "each enterprise has: one revenue component."*

In sum, the value streams of the present invention cannot be correlated with the current-operation value in Eder. Therefore, Eder does not disclose financial value streams as they are defined in the present invention. Accordingly, the Board should overturn the § 103(a) rejection of all pending claims.

4. Eder does not disclose assumed variables that are tied to at least one future or past event.

Claims 18 and 21-22 of the present application require "determining, by use of the computer system, an outcome for the value stream of the business enterprise based upon the assumed variables and events of the base case scenario" where "the assumed variables" refers to "a plurality of assumed variables that have an influence on a value stream of the business enterprise" and where each assumed variable is tied to "at least one future or past event ... that influences the corresponding assumed variable." Eder does not disclose or suggest this method of determining the outcome for a value stream, and the Examiner has not shown otherwise.

The concept of "events" is entirely absent from Eder. The word "event" occurs only once in the Eder specification as one attribute of sales management systems. *Eder at 15:39.* There is no suggestion anywhere in Eder that Eder's components of value, elements of value, or value drivers are in any way tied to events. In other words, there is no suggestion in Eder that any variables are linked to specific events, let alone an assertion, as in the present invention, that each and every assumed variable is linked to one or more events. If Eder does not disclose data indicating the occurrence or non-occurrence of events, it cannot tie such events to its value calculations.

This is consistent with the contrasting goals of Eder versus the present invention. Eder is focused on calculating a valuation of tangible and intangible assets in relation to an overall enterprise valuation as of a particular point in time. Eder, therefore, has little need for events. Claims 18 and 21-22, by contrast, are focused on the analysis of changes in value potential of value streams as events unfold over time.

Because Eder does not mention events in relation to the variables used in its methods, it does not disclose determining the outcome of a value stream by using assumed variables that are

tied to "at least one future or past event." Accordingly, the Board should overturn the § 103(a) rejection of claims 18 and 21-22.

5. Belani does not disclose access control for assumed variables or any resource that is comparable to assumed variables.

In the Examiner's January 31, 2007 Office Action, she admits that Eder does not disclose the limitation of "authorizing a user to alter one or more of the assumed variables based on a level of authorization of the user and a level of the hierarchy in which the assumed variables are positioned, wherein different levels of authorization have access to different levels of assumed variables." *Office Action of Jan. 31, 2007 at pp. 6, 10, and 16.* This limitation or substantially similar limitations appear in claims 1-5, 8-9, 11, 14-18, and 21-22.

The Examiner has conceded that the first two references she cited in an attempt to remedy this deficiency of Eder (U.S. Patent Nos 5,446,903 to Abraham and 5,414,844 to Wang) are also deficient. *See Office Action of Jul. 28, 2006 at p. 2, Office Action of Jan. 4, 2006 at p. 2.* Likewise, the Examiner's third reference cited to remedy the deficiency, Belani, is deficient as well. Belani does not disclose the recited claim limitation and the Examiner has not shown otherwise. Moreover, the rejection strategy employed — repeatedly and selectively culling disjointed prior art references in order to fit the blue print of the pending claims — demonstrates the hindsight nature of the Examiner's analysis.

Belani deals with access to computer resources in a multi-domain distributed computing network. *Belani at 1:60-63.* For example, Belani is concerned with determining whether a user *U* is authorized to perform operation *O* on resource *R*. *Id. at 9:15-17.* Belani defines resources as "information resources such as databases, files, etc. or operational resources such as devices or processes." *Id. at 2:15-18.* Belani also explains that resources can include "a file or database or any other data storage means." *Id. at 7:6-9.*

Belani does not, however, disclose access control for assumed variables or any computer resource that is comparable to assumed variables. Although the assumed variables of the present invention may be stored in a matrix in a database, they are not a database themselves. *See, e.g., Appellant's Specification as filed at 9:30-31.* Rather, the assumed variables are simply data that may be stored in a variety of ways, one of which is in a database. Treating the assumed variables and a database as the same would ignore the fundamental difference between data and a particular means of storing it. Moreover, with regard to the access control system in Belani,

treating assumed variables and a database as the same would ignore the fundamental differences between controlling access to a database as a whole and controlling access to individual units of data stored therein. This difference is significant because access control for individual units of data in a database increases in complexity as the amount of data in the database increases. The complexity of access control for a database as a whole, by contrast, is independent of the amount of data stored in the database. In short, assumed variables are not comparable to the databases in Belani.

Nor are the assumed variables of the present invention comparable to any other computer resource disclosed in Belani. The "files" in Belani are simply a less sophisticated means of data storage and therefore share the same deficiencies as databases, as discussed above. The "operational resources such as devices or processes" are also distinguishable from assumed variables. The only "devices" discussed in Belani are memory subsystems, file storage subsystems, input devices (a keyboard, a mouse, or a scanner) and output devices (a printer, or a visual display). *Belani at 5:45-6:7.* The devices in Belani are therefore fundamentally different than assumed variables, which are simply data. Likewise, the "processes" in Belani are capable of "executing on a user system." *Id. at 5:31-32.* The assumed variables of the present invention are entirely devoid of this capability.

In sum, Belani does not disclose controlling access to assumed variables, as recited in claims 1-5, 8-9, 11, 14-18, and 21-22. Accordingly, the Board should overturn the § 103(a) rejection with respect to these claims.

6. The combination of Belani and Eder produces a system that is inoperative and fatally flawed.

Claims 1-5, 8-9, 11, 14-18, and 21-22 of the present invention each recite "a multi-level hierarchy in which assumed variables positioned at a lower level in the hierarchy influence one or more assumed variables positioned at a higher level in the hierarchy" or a substantially similar limitation (hereinafter the "assumed variable hierarchy" limitation). *Claims Appendix, pp. 16-23.* These claims also recite "authorizing a user to alter one or more of the assumed variables based on a level of authorization of the user and a level of the hierarchy in which the assumed variables are positioned, wherein different levels of authorization have access to different levels of assumed variables" or a substantially similar limitation (hereinafter the "level-based access control" limitation). *Id.*

The Examiner argues that Eder discloses the first limitation, the assumed variable hierarchy, and Belani discloses the second limitation, the level-based access control. As discussed above and as summarized below, however, Eder and Belani do not disclose these limitations. But even *assuming arguendo* that Eder and Belani disclose these limitations, Eder and Belani are incompatible – their combination would produce a system that is non-operative and fatally flawed. Because a proposed obviousness combination must suggest "a reasonable likelihood of success" to one of skill in the art, the combination of Eder and Belani cannot be the basis of a § 103(a) rejection. *In re Dow Chemical Co.*, 837 F.2d 469 (Fed. Cir. 1988).

The Examiner contends that Eder discloses an assumed variable hierarchy because the expense component and the capital component of the current-operation value are subdivided into sub-components, such as the cost of raw materials and the cost of support, and these sub-components influence the expense component and capital component, which in turn influence the current-operation value. *Office Action of Jan. 31, 2007 at pp. 5-6; Eder at 11:27-34.* As discussed above, however, the current-operation value is not a value stream and therefore these sub-components cannot be assumed variables. (All of the present application's independent claims recite that assumed variables "have an influence on a value stream.") For purposes of showing how the Eder/Belani combination is non-operative, however, it will be assumed *arguendo* that these sub-components indeed form an assumed variable hierarchy.

The Examiner also contends that Belani discloses level-based access control because it discusses a hierarchy of computer resources where lower-level resources inherit the authorization rules of higher level resources. *Office Action of Jan. 31, 2007 at pp. 6-7; Belani at 9:4-30, Fig. 6.* Belani Figure 6 is recreated below.

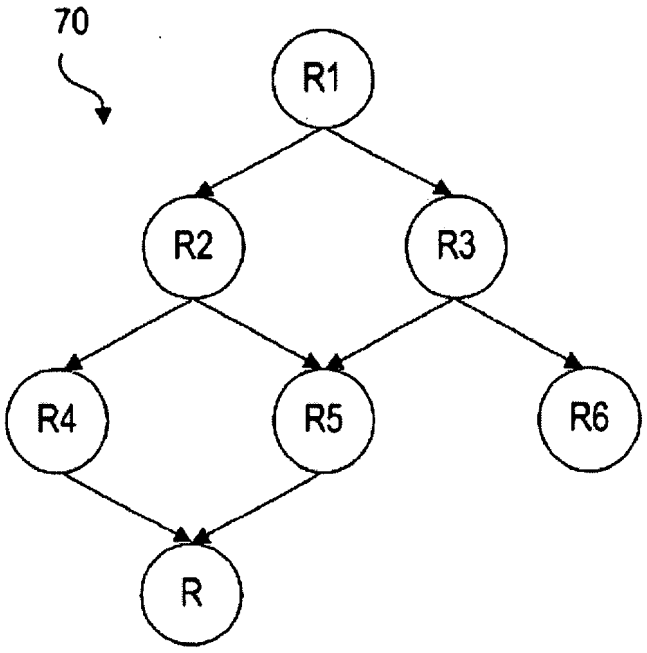
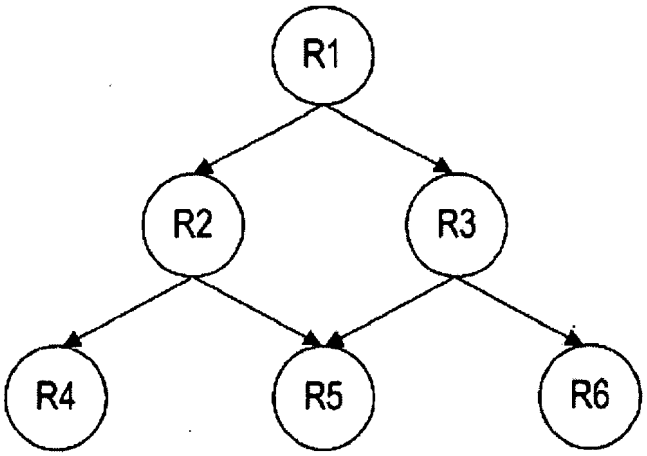


Fig. 6

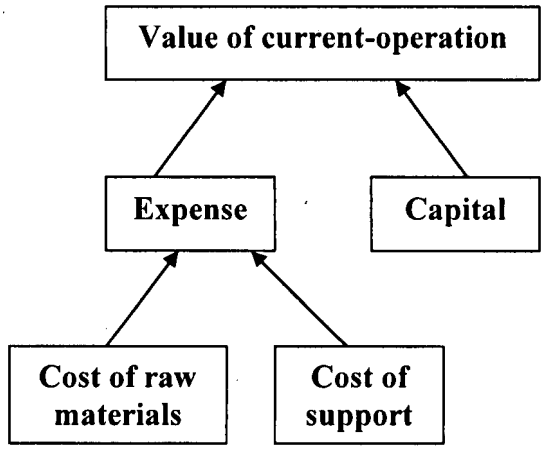
As shown in Figure 6, if a user is authorized to perform a certain operation on resource *R2*, that user is automatically authorized to perform that operation on the lower-level resources *R4* and *R5* because they inherit the authorization rules of *R2*. As discussed above, however, the computer resources in Belani do not include assumed variables and therefore Belani does not disclose the level-based access control limitation. For purposes of showing the Eder/Belani combination is non-operative, however, it will be assumed *arguendo* that Belani's computer resources hierarchy meets the level-based access control limitation.

The figure below shows a simplified version of Figure 6 from Belani next to a graphical representation of the variable hierarchy from Eder (for simplicity, not all components or sub-components from Eder are shown). The arrows in the Eder figure show that the low-level sub-components (e.g. the cost of raw materials) influence the mid-level components (e.g. expense), which influence the high-level value of current-operation. The arrows in the Belani figure show that the inheritance flows from top to bottom, as described above.

Belani



Eder



If the Eder hierarchy were combined with the Belani access control, however, the resulting system would be fatally flawed. Because inheritance in the Belani access control hierarchy flows from top to bottom, a user's authorization to perform a certain operation will generally stop at a certain level and not reach any higher levels (except in the case where the user is authorized to perform an operation on all resources, which is not an interesting case). For example, a user may be authorized to perform an operation on resource *R2* (and therefore on resources *R4* and *R5*), but not on resource *R1*.

But if this type of access control were used to control access to the variables in Eder, the Eder hierarchy would become flawed. For example, let a user be authorized to alter the variable "Expense" but not the variable "Value of current-operation." The user could alter the value of "Expense," but the value of "current-operation" would not be updated to reflect the new value because that user does not have permission to change the "current-operation" variable. This would break the fundamental relationship on which the Eder hierarchy depends (e.g. value of current-operation = expense + capital + revenue). Contrary to "maintaining the integrity of the data within the system" as the Examiner suggests, the combination of Eder and Belani will *destroy* the integrity of the data on which Eder relies. *Office Action of Jan. 31, 2007 at p. 7.*

The only way a user could properly update a variable in Eder would be to have permissions to change all the higher-level values that the variable influences. But this type of all-or-nothing access is contrary to the *level-based* access control of the present claims ("different levels of authorization have access to different levels of assumed variables"). *See,*

e.g., claim 1. In other words, it is not possible to combine the access control of Belani with Eder without breaking the Eder hierarchy.

In sum, the combination of Eder and Belani is fatally flawed and would not give rise to the "reasonable likelihood of success" required for a proper obviousness combination. Accordingly, the Board should overturn the § 103(a) rejection of claims 1-5, 8-9, 11, 14-18, and 21-22.

7. The combination of Belani and Eder does not produce a system allowing a user to provide real-time feedback.

Claims 10, 12, and 13 of the present application are similar to the claims just discussed except that they recite "authorizing a plurality of users to provide real-time feedback" rather than "authorizing a user to alter one or more of the assumed variables." *Claims Appendix pp. 18-20.* The Examiner has conceded that "there is no patentable distinction between a user providing real-time feedback versus a user altering a variable as both have a user submitting or editing data." *Office Action of Jan. 31, 2007 at p. 5.* In other words, the Examiner has conceded that there is no patentable distinction between claims 10, 12, and 13 and the claims discussed above that recite a user altering assumed variables. Because the claims discussed above are patentable in light of the fatally-flawed Eder/Belani combination, claims 10, 12, and 13 are patentable as well for the same reasons. Accordingly, the Board should overturn the § 103(a) rejection of claims 10, 12, and 13.

B. Conclusion

In view of the foregoing arguments, claims 1-5, 8-18, and 21-22 are patentable over Eder and Belani and all proposed combinations of those references.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account **No. 07-1896** referencing Attorney Docket **No. 350176-991110**. This paper is submitted in triplicate.

Respectfully submitted,

DLA Piper US LLP

Dated: May 25, 2007

By: _____

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VIII. CLAIMS APPENDIX

1. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing a data structure, by use of a computer system, including assumed variables that have an influence on a value stream of the business enterprise, the assumed variables in said data structure being arranged in a multi-level hierarchy in which assumed variables positioned at a lower level in the hierarchy influence one or more assumed variables positioned at a higher level in the hierarchy;

determining, by use of the computer system, a first outcome for the value stream of the business enterprise based upon the assumed variables;

authorizing a user to alter one or more of the assumed variables based on a level of authorization of the user and a level of the hierarchy in which the assumed variables are positioned, wherein different levels of authorization have access to different levels of assumed variables; and

determining a second outcome for the value stream of the business enterprise taking into account the altered assumed variables.

2. (original): The method according to claim 1, wherein the first outcome includes a present financial value of the value stream.

3. (original): The method according to claim 1, wherein the first outcome includes a non-financial metric.

4. (previously presented): The method according to claim 1, further comprising:

authorizing each of a plurality of users to alter the assumed variables based on the level of authorization of each of the users and a level of the hierarchy in which the assumed variables are positioned, wherein different levels of authorization have access to different levels of assumed variables;

storing, for each altered assumed variable, an identification of the user who made the alteration; and

determining alternate outcomes for the value stream of the business enterprise taking into account selected aggregations of the altered assumed variables wherein the selected aggregations are formed according to the stored identifications.

5. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing a data structure, by use of a computer system, including a plurality of assumed variables that have an influence on a value stream of the business enterprise, wherein the assumed variables are arranged in a multi-level hierarchy in which assumed variables positioned at a lower level in the hierarchy influence one or more assumed variables positioned at a higher level in the hierarchy, the data structure having a portion which defines a base case scenario for the business enterprise;

determining, by use of a computer system, an outcome for the value stream of the business enterprise based upon the assumed variables of the base case scenario;

authorizing a plurality of users to alter one or more of the assumed variables based on a level of authorization of each user and a level of the hierarchy in which the

assumed variables are positioned, wherein different levels of authorization have access to different levels of assumed variables;

storing each altered assumed variable in the data structure in association with an identifier of the user who made the alteration, and maintaining the assumed variables of the base case scenario unchanged by the plurality of users;

aggregating selected ones of the altered assumed variables and selected ones of the assumed variables of the base case scenario in accordance with the stored identifiers to form one or more alternate scenarios; and

determining, by use of the computer system, an outcome for the value stream of the business enterprise based upon each of the alternate scenarios.

6. (canceled):

7. (canceled):

8. (original): The method according to claim 5, wherein the outcome of the base case scenario includes a present financial value of the value stream.

9. (original): The method according to claim 8, wherein the outcome of the base case scenario includes a non-financial metric.

10. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing a data structure, by use of a computer system, including a plurality of assumed variables that have an influence on a value stream of the business enterprise, the data structure having a portion which defines a base case scenario for the business enterprise;

determining, by use of a computer system, an outcome for the value stream of the business enterprise based upon the assumed variables of the base case scenario;

selectively authorizing a plurality of users to provide real-time feedback on the value creation performance of the business enterprise based on a level of authorization of each user, wherein only certain levels of authorization are permitted to provide real-time feedback;

storing the real-time feedback in the data structure in association with an identifier of the user who provided each portion of the feedback, and maintaining the assumed variables of the base case scenario unchanged by the plurality of users;

aggregating selected ones of the portions of the feedback and selected ones of the assumed variables of the base case scenario; and

determining, by use of the computer system, an outcome for the value stream of the business enterprise based upon the selected ones of the portions of the feedback and the selected ones of the assumed variables of the base case scenario.

11. (previously presented): The method according to claim 10, wherein the assumed variables are arranged in a multi-level hierarchy in which assumed variables positioned at a lower level in the hierarchy influence one or more assumed variables positioned at a higher level in the hierarchy; and

wherein the a plurality of users is authorized to alter one or more of the assumed variables based on a level of authorization of each user and a level of the hierarchy in which the assumed variables are positioned, wherein different levels of authorization provide access to different levels of assumed variables.

12. (original): The method according to claim 10, wherein the outcome of the base case scenario includes a present financial value of the value stream.

13. (original): The method according to claim 10, wherein the outcome of the base case scenario includes a non-financial metric.

14. (previously presented): A system for processing data relating to the performance of a business enterprise in creating value, comprising:

a memory device for storing a data structure including assumed variables that have an influence on a value stream of the business enterprise, the assumed variables in said data structure being arranged in a multi-level hierarchy in which assumed variables positioned at a lower level in the hierarchy influence one or more assumed variables positioned at a higher level in the hierarchy;

means for authorizing a user to alter one or more of the assumed variables based on a level of authorization of the user and a level of the hierarchy in which the assumed variables are positioned, wherein different levels of authorization have access to different levels of assumed variables;

a filter for selecting certain ones of the assumed variables and for selecting certain ones of the altered assumed variables; and

a calculation engine for receiving the certain ones of the assumed variables and the certain ones of the altered assumed variables from the filter and for determining an outcome for the financial value stream of the business enterprise based upon the certain ones of the assumed variables and the certain ones of the altered assumed variables.

15 (original): The system according to claim 14, wherein the outcome includes a present financial value of the value stream.

16. (original): The system according to claim 14, wherein the outcome includes a non-financial metric.

17. (original): The system according to claim 14, further comprising:

means for authorizing each of a plurality of users to alter the assumed variables according to a level of the hierarchy in which the assumed variables are positioned, wherein for each altered assumed variable, an identification of the user who made the alteration is stored in the data structure; and

means for determining alternate outcomes for the value stream of the business enterprise taking into account selected aggregations of the altered assumed variables wherein the selected aggregations are formed according to the stored identifications.

18. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing, by use of a computer system, a data structure including a plurality of assumed variables that have an influence on a value stream of the business enterprise and at least one future or past event for each assumed variable that influences the corresponding assumed variable, wherein the assumed variables are arranged in a multi-level hierarchy in which assumed variables positioned at a lower level in the hierarchy influence one or more assumed variables positioned at a higher level in the hierarchy, the data structure having a portion which defines a base case scenario for the business enterprise;

determining, by use of the computer system, an outcome for the value stream of the business enterprise based upon the assumed variables and events of the base case scenario;

authorizing a plurality of users to alter selected ones of the events and selected ones of the assumed variables based on a level of authorization of each user and a level of the hierarchy in which the assumed variables are positioned, wherein different levels of authorization provide access to different levels of assumed variables;

storing each altered assumed variable and each altered event in the data structure in association with an identifier of the user who made the alteration, and maintaining the assumed variables and events of the base case scenario unchanged by the plurality of users;

aggregating selected ones of the altered assumed variables and events along with selected ones of the assumed variables and events of the base case scenario in accordance with the stored identifiers to form one or more alternate scenarios; and

determining, by use of the computer system, an outcome for the value stream of the business enterprise based upon each of the alternate scenarios.

19. (canceled)

20. (canceled)

21. (original): The method according to claim 18, wherein the outcome of the base case scenario includes a present financial value of the value stream.

22. (original): The method according to claim 18, wherein the outcome of the base case scenario includes a non-financial metric.

IX. EVIDENCE APPENDIX

A. Exhibit A - Declaration of David L. Alberti in support of Appellant's Appeal Brief ("Alberti Decl.").

1. Alberti Decl., Exhibit 1 – Office Action of April 7, 2006 from Application No. 09/574,569.

2. Alberti Decl., Exhibit 2 – Appeal Brief of October 16, 2006 from Application No. 09/574,569.

3. Alberti Decl., Exhibit 3 – Office Action of January 24, 2007 from Application No. 09/574,569.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of Robert I.G. MCLEAN, et al.

Application No. 09/586,722

Attorney Docket No. 350725-991110

Filed: June 5, 2000

For: DATA PROCESSING SYSTEM AND METHOD THAT PROVIDES AN INTEGRATED AND COMPREHENSIVE USER INTERFACE FOR ANALYSIS OF VALUE CREATION PERFORMANCE OF A BUSINESS ENTERPRISE

Group Art Unit: 3623

Examiner: Tarae, C. Michelle

DECLARATION OF DAVID L. ALBERTI IN SUPPORT OF APPELLANT'S APPEAL BRIEF

2000 University Avenue
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Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as FIRST CLASS MAIL in an envelope addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on:

May 25, 2007

Maria Paula Kovacs

Dear Sir/Madam:

This is a declaration in support of the appeal brief filed in response to a final Office action dated January 31, 2007, and from a Notice of Appeal that was filed on April 16, 2007.

I. DECLARATION

I, David L. Alberti, hereby declare and state as follows:

I am a partner with the law firm of DLA Piper US LLP. I am the prosecuting attorney for the application referenced above as well as the related application, U.S. Application Serial No. 09/574,569 ("the '569 application"), filed May 17, 2000, and entitled "CONTINUOUSLY UPDATED DATA PROCESSING SYSTEM FOR MEASURING FINANCIAL VALUE CREATION." I have personal knowledge of the facts stated herein and, if called as a witness, I could and would competently testify thereto.

1. Attached as **Exhibit 1** is a true and correct copy of the April 7, 2006 Office action issued in connection with the prosecution of the '569 application, in which the Examiner assigned to the '569 application uses U.S. Patent No. 6,321,205 to Eder ("Eder") as the primary reference to reject that application's claims under § 103(a).

2. Attached as **Exhibit 2** is a true and correct copy of the Appellant's October 16, 2006 Appeal Brief, submitted in response to the Office action of April 7, 2006 (Exhibit 1). The Appeal Brief explains that Eder is deficient in a variety of ways for purposes of rendering the '569 application obvious under § 103(a).

3. Attached as **Exhibit 3** is a true and correct copy of the January 24, 2007 Office action issued in connection with the prosecution of the '569 application and in response to Appellant's October 16, 2006 Appeal Brief (Exhibit 2). In the Office action, the Examiner withdraws all rejections based on Eder, re-opens prosecution, and relies on different references for the new rejections contained therein.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully submitted,

DLA Piper US LLP

Dated: May 25, 2007

By: _____

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B. RELATED PROCEEDINGS APPENDIX

NONE

Exhibit 1

UNITED STATES PATENT AND TRADEMARK OFFICE

350725-991100/US

UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/574,569	05/17/2000	Robert I.G. McLean	C1197-991100	7629

26379 7590 04/07/2006

DLA PIPER RUDNICK GRAY CARY US, LLP
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CALENDARED
BY:
FOR: DLA
RESPONSE/EVENT: Resp to F. Rej / Ntc of Appeal
OPP: 07 July 2006
REPLY: 07 Oct 2006

EXAMINER	
DASS, HARISH T	

ART UNIT	PAPER NUMBER
3628	

DATE MAILED: 04/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/574,569	MCLEAN ET AL.	
	Examiner	Art Unit	
	Harish T. Dass	3628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01/03/2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5-11, 13-24, 26-30, 32-39, 41-46 and 48-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eder (US 6,321,205) in view of Phillips et al (hereinafter Phillips - US 6792399).

Re. Claim 1, Eder discloses an automated system and a computer based method for evaluating the probable impact of changes in business value and future value of a commercial enterprise accounting for tangible assets as intangible assets, [Eder - Abs; Fig. 1-16; C1 L17-L54], and

developing a data structure including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or, past event linked to each assumed variable that influences the corresponding assumed variable [Eder – see entire document particularly, [Eder - C12 L3-L8; C17 L5 to C18 L12; C19 L3-L20; -- see C17 L52-L58 (The valuation of the current operation by the system requires sales, operation, finance, external database and human resource data for the three year period before and the four year period after the specified valuation date) and Abstract (generated changes in business value drivers on the other

value drivers, the financial performance and the future value of a commercial enterprise = future financial value streams)];

determining, by use of the computer system, a first present value (PV) of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money [Eder – C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67],

receiving as input into the computer system data from a user [Figure 4; C7 L10-L13; C8 L26-L67];

determining, by use of the computer system, in response to the occurrence or non-occurrence (different valuation methodology) of one or more of the future events, whether one or more of the assumed variables (estimated) have changed and whether the influenced future financial value stream has changed (comparing current value & previous value with different elements) [C5 L16 to C6 L64; C24 L20-L33; C35 L35 to C37 L20; C44 L7-L67; C45 L57 to C46 L4].

Determining, by use of the computer system, a second present value of the future financial value stream taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events [Eder - C28 L13-L60; C33 L24-L45].

Eder does not explicitly disclose data indicating the occurrence or non-occurrence of one or more of the future events. However, Phillips discloses this step [C25 L24-L36; C64 L36 to C66 L7 – see anticipated and unexpected] to estimate the

present value of the expected firm (corporation, future value of commodity or an item) specific information (increase/decrease future value/income, sale, or etc.) For example; Exxon's future value based on the war in Iraq if the war continues for another few years or stops next month/year. Similarly, the price of oil as a commodity, it well keeps increasing or fall once the war is over or OPEC will make changes to its production. Example 2: Price of US corn in international market depends on the weather and harvest in other counties and for future option prices some of the factors are assumed, it may happen or not. Example 3: No one in Merck Pharmaceutical new that their drug Vioxx will be off the market due to raised questions about **heart problems.**

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Eder and include occurrence or non-occurrence of one or more of the future events, as disclosed by Phillips, to analyze the impact of events on the future value of the corporation or a commodity.

Re. Claim 2, Eder discloses wherein determining the first present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized, and determining the second present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized taking into account an assessed probability that changed in response to the occurrence or non-occurrence of the one or more of the future events [C35 L12 to C37 L20; C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67].

Re. Claim 3 Eder discloses wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream [Fig. 14 such as: brand-names, customer-base, etc; ref. claim 1].

Re. Claim 5 Eder discloses changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables, and determining the present value of the future financial value stream based upon the alternate scenario [C35 L35-L49; C44 L7 to C46 L4]; and

comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario [C35 L35-L49; C44 L7 to C46 L4].

Re. Claims 6-7 Eder discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream, and selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream [Figure. 2, 4, 7, 14-15; C10 L1 to C12 L30; C14 table 7].

Re. Claim 8, Eder discloses determining a variance between the first present value and the second present value taking into account the time value of money between the first and second dates; and attributing (Quantity) the variance between the first present value and the second present value to events that occurred between the first and second dates [C10 L40 to C11 L21; LC14 table 7].

Re. Claim 9, Eder discloses an automated system and method for evaluating the probable impact of changes in business value and future value of a commercial enterprise accounting for tangible assets as intangible assets, [Eder - Abs; Fig. 1-16; C1 L17-L54], and

developing a data structure, by use of the computer system, including a plurality of future financial value streams, each future financial value stream having one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event linked to each assumed variable that influences the corresponding assumed variable [Eder - C12 L3-L8; C17 L5 to C18 L12; C19 L3-L20 – see claim 1 above];

determining, by use of the computer system, a present value of each future financial value stream by aggregating the influences on the future financial value stream attributable to the assumed variables of the future financial value streams and adjusting the future financial value streams for a time value of money [C10 L41 to C12 L30; C17 L47-L67];

receiving as input into the computer system data from a user [Figure 4; C7 L10-L13; C8 L26-L67];

aggregating the present value of each future financial value stream to form a first aggregate present financial value of the plurality of future financial value streams [table 1 C5 L31 to C6 L25];

determining, by use of the computer system, in response to the occurrence or non-occurrence of one or more of the future events for one or more of the future financial value streams, whether one or more of the assumed variables have changed and whether the influenced future financial value stream has changed [C5 L16 to C6 L64; C24 L20-L33; C35 L35 to C37 L20]; and

forming a second aggregate present value of the plurality of future financial value streams taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events [C 3 L60 to C4 L19; C5 L16 to C6 L64; C24 L20-L33; C35 L35 to C37 L20].

Eder does not explicitly disclose data indicating the occurrence or non-occurrence of one or more of the future events. However, Phillips discloses this step [C25 L24-L36; C64 L36 to C66 L7 – see anticipated and unexpected] to estimate the present value of the expected firm (corporation, future value of commodity or an item) specific information (increase/decrease future value/income, sale, or etc.) For example; Exxon's future value based on the war in Iraq if the war continues for another few years or stops next month/year. Similarly, the price of oil as a commodity, it well keeps increasing or fall once the war is over or OPEC will make changes to its production. Example 2: Price

of US corn in international market depends on the weather and harvest in other counties and for future option prices some of the factors are assumed, it may happen or not. Example 3: No one in Merck Pharmaceutical new that their drug Vioxx will be off the market due to raised questions about heart problems.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Eder and include occurrence or non-occurrence of one or more of the future events, as disclosed by Phillips, to analyze the impact of events on the future value of the corporation or a commodity.

Re. Claim 10, Eder discloses wherein determining the present value of each future financial value stream further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized[C35 L12 to C37 L20; C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67].

Re. Claim 11, Eder discloses wherein each of the plurality (multiple) of future financial value streams is associated with activities of the business enterprise necessary to give rise to the events associated with the corresponding future financial value stream [Fig. 14 such as: brand-names, customer-base, etc; see ref. claim 1].

Re. Claim 13 Eder discloses changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables [C35 L35-L49; C44 L7 to C46 L4];

determining an aggregate present value of the plurality of future financial value streams based upon the alternate scenario [C35 L35-L49; C44 L7 to C46 L4], and

comparing the aggregate present value of the plurality of future financial value streams based upon the alternate scenario to the first aggregate present value of the plurality of future financial value streams based upon the base case scenario [C35 L35-L49; C44 L7 to C46 L4].

Re. Claims 14-15, Eder discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second aggregate present value of the plurality of future financial value streams and selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second aggregate present value of the plurality of future financial value streams [Figure. 2, 4, 7, 14-15; C10 L1 to C12 L30; LC14 table 7].

Re. Claim 16, Eder discloses determining a variance between the first aggregate present value and the second aggregate present value taking into account the time value of money between the first and second dates; and attributing the variance between the first aggregate present value and the second aggregate present value to events that occurred between the first and second dates [C10 L40 to C11 L21; LC14 table 7].

Re. Claim 17 Eder discloses developing a data structure, by use of the computer system, including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event for each assumed variable that influences the corresponding assumed variable [- C12 L3-L8; C17 L5 to C18 L12; C19 L3-L20];

determining, by use of the computer system, a first present value of the future financial value stream of the business enterprise as of a first specified date by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money [C10 L41 to C12 L30; C17 L47-L67];

determining, by use of the computer system, a second present value of the future financial value stream of the business enterprise as of a second specified date by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money [C11 L36 to C12 L30; table 1 C5; C28 L13-L60; C33 L24-L45] and forecasting [C13 L54 to C14 L40; table 7], and determining a variance between the first present value and the second present value taking into account a time value of money between the first and second dates (delivery date variance), and attributing the variance between the first present value and the second present value to events that occurred between the first and second specified dates (Quantity) [C10 L40 to C11 L21; LC14 table 7].

Re. Claim 18 Eder discloses wherein determining a first present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized, and determining the second present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized [C35 L12 to C37 L20; C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67].

Re. Claim 19, Eder discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream[Figure. 2, 4, 7, 14-15; C10 L1 to C12 L30; LC14 table 7].

Re. Claim 20, Eder discloses determining a present value of each of a plurality of additional future financial value streams and aggregating the present value of the future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams [C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67; C24 L60 to C25 L56; C19 L3-L20].

Re. Claim 21 Eder discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining a present value of a future financial value stream of the business enterprise [Figure. 2, 4, 7, 14-15; C11 L1 to C12 L30];

developing, by use of the computer system, a data structure including one or more assumed variables that have an influence on the future financial value stream of

the business enterprise from the perspective of the selected stakeholder and at least one future or past event linked to each assumed variable that influences the corresponding assumption [C12 L3-L8; C17 L5 to C18 L12; C19 L3-L20 – see claim 1 above]; and

determining, by use of the computer system, a present value of the future financial value stream of the business enterprise from the perspective of the selected stakeholder by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money [C11 L36 to C12 L30 ;].

Re. Claim 22 Eder discloses wherein determining the present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized [C35 L12 to C37 L20; C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67].

Re. Claim 23 Eder discloses wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream [Fig. 14 such as: brand-names, customer-base, etc; ref. claim 1].

Re. Claim 24 Eder discloses selecting one or more additional stakeholder perspectives from among the plurality of stakeholder perspectives for determining the first present

value of the future financial value stream [Figure. 2, 4, 7, 14-15; C10 L1 to C12 L30; C14 table 7].

Re. Claim 26 Eder discloses changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables, and determining the present value of the future financial value stream based upon the alternate scenario; and comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario [C35 L35-L49; C44 L7 to C46 L4].

Re. Claim 27, Eder discloses determining a present value of each of a plurality of additional future financial value streams from the perspective of the selected stakeholder; and aggregating the present value of the future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams [C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67; C24 L60 to C25 L56; C19 L3-L20].

Re. Claim 28, Eder discloses repeatedly determining and presenting a series of updated present values of the future financial value stream, each updated present value determined from the events and assumed variables in the data structure including any assumed variables that have changed in response to the occurrence or non-occurrence

of one or more of the future events [C5 L16 to C6 L64; C24 L20-L33; C28 L13-L60; C33 L24-L45; C35 L35 to C37 L20; C44 L7 to C46 L4; C34 L21-L63; C39 L16-L35].

Re. Claim 29 Eder discloses developing, by use of the computer system, a data structure including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event linked to each assumed variable that influences the corresponding assumed variable [C12 L3-L8; C17 L5 to C18 L12; C19 L3-L20 – see claim 1 above];

identifying and segregating risks specific to the future financial value stream from risks specific to the business enterprise or industry as a whole, and assigning probabilities to the events or assumed variables based on the identified risks [C35 L12 to C37 L20];

determining, by use of the computer system, a first present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables, adjusting the future financial values stream by the assigned probabilities, and further adjusting the future financial value stream for a time value of money [C35 L12 to C37 L20; C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67];

receiving as input into the computer system data from a user [Figure 4; C7 L10-L13; C8 L26-L67];

determining, by use of the computer system, in response to the occurrence or non-occurrence of one or more of the future events, whether one or more of the

assumed variables have changed and whether the influenced future financial value stream has changed [C5 L16 to C6 L64; C24 L20-L33; C35 L35 to C37 L20]; and

determining, by use of the computer system, a second present value of the future financial value stream taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events [C28 L13-L60; C33 L24-L45].

Eder does not explicitly disclose data indicating the occurrence or non-occurrence of one or more of the future events. However, Phillips discloses this step [C25 L24-L36; C64 L36 to C66 L7 – see anticipated and unexpected] to estimate the present value of the expected firm (corporation, future value of commodity or an item) specific information (increase/decrease future value/income, sale, or etc.) For example; Exxon's future value based on the war in Iraq if the war continues for another few years or stops next month/year. Similarly, the price of oil as a commodity, it well keeps increasing or fall once the war is over or OPEC will make changes to its production. Example 2: Price of US corn in international market depends on the weather and harvest in other counties and for future option prices some of the factors are assumed, it may happen or not. Example 3: No one in Merck Pharmaceutical new that their drug Vioxx will be off the market due to raised questions about **heart problems.**

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Eder and include occurrence or non-occurrence of one or more of the future events, as disclosed by Phillips, to

analyze the impact of events on the future value of the corporation or a commodity.

Re. Claim 30 Eder discloses wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream [Fig. 14 such as: brand-names, customer-base, etc; ref. claim 1].

Re. Claim 32, Eder discloses changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables;

determining the present value of the future financial value stream based upon the alternate scenario; and

comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario [C35 L35-L49; C44 L7 to C46 L4].

Re. Claims 33-34, Eder selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream and selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream [Figure. 2, 4, 7, 14-15; C10 L1 to C12 L30; LC14 table 7].

Re. Claim 35, Eder discloses determining a variance between the first present value and the second present value taking into account the time value of money between the first and second dates; and attributing the variance between the first present value and the second present value to events that occurred between the first and second specified dates [C10 L40 to C11 L21; LC14 table 7].

Re. Claim 36, Eder discloses determining a present value of each of a plurality of additional future financial value streams; and aggregating the present value of the first future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams [C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67; C24 L60 to C25 L56; C19 L3-L20].

Re. Claim 37 Eder discloses developing, by use of the computer system, a data structure including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event for each assumed variable that influences the corresponding assumed variable [C12 L3-L8; C17 L5 to C18 L12; C19 L3-L20];

determining, by use of the computer system, a present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money, wherein the events and assumed variables collectively form a base case scenario for the business enterprise,

and the first present value of the future financial value stream is based upon the base case scenario [C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67; C35 L12 to C37 L20];

changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables [C35 L35-L49; C44 L7 to C46 L4], and determining, by use of the computer system, the present value of the future financial value stream based upon the alternate scenario [C35 L35-L49; C44 L7 to C46 L4], and

comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario [C35 L35-L49; C44 L7 to C46 L4].

Re. Claim 38 Eder discloses wherein determining the present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the financial value stream will be realized [C35 L35-L49; C44 L7 to C46 L4].

Re. Claim 39 Eder discloses wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream [Fig. 14 such as: brand-names, customer-base, etc; ref. claim 1].

Re. Claims 41-42, Eder discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the present value of the future

financial value stream and selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the present value of the future financial value stream [Figure. 2, 4, 7, 14-15; C10 L1 to C12 L30; LC14 table 7].

Re. Claim 43, Eder discloses determining a present value of each of a plurality of additional future financial value streams; and aggregating the present value of the first future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams [C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67; C24 L60 to C25 L56; C19 L3-L20].

Re. Claim 44 Eder discloses developing, by use of the computer system, a data structure including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event for each assumed variable that influences the corresponding assumed variables [C12 L3-L8; C17 L5 to C18 L12; C19 L3-L20];

determining, by use of the computer system, a first present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money [C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67]; and

repeatedly determining and presenting a series of updated present values of the future financial value stream, each updated present value determined from the events

and assumed variables in the data structure including any assumed variables that have changed in response to the occurrence or non-occurrence of one or more of the future events [C5 L16 to C6 L64; C24 L20-L33; C28 L13-L60; C33 L24-L45; C35 L35 to C37 L20; C44 L7 to C46 L4; C34 L21-L63; C39 L16-L35].

Re. Claim 45 Eder discloses wherein determining the first present value and determining each updated present value further comprise adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized [C35 L12 to C37 L20; C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67].

Re. Claim 46 Eder discloses wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream [Fig. 14 such as: brand-names, customer-base, etc; ref. claim 1].

Re. Claim 48 Eder discloses changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables, and determining the present value of the future financial value stream based upon the alternate scenario; and comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario [C35 L35-L49; C44 L7 to C46 L4].

Re. Claims 49-50, Eder discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream and selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream [Figure. 2, 4, 7, 14-15; C10 L1 to C12 L30; LC14 table 7].

Re. Claim 51, Eder discloses determining a variance between the first present value and the selected updated present value taking into account the time value of money between the first and second dates; and attributing the variance between the first present value and the selected updated present value to events that occurred between the first and second dates [C10 L40 to C11 L21; LC14 table 7].

Re. Claim 52, Eder discloses determining a present value of each of a plurality of additional future financial value streams; and aggregating the present value of the first future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams [C5 table 1 to C6 L25; C10 L41 to C12 L30; C17 L47-L67; C24 L60 to C25 L56; C19 L3-L20].

Claims 4, 12, 25, 31, 40 & 47 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Eder and Phillips as applied to claims 1, 9, 21, 29, 37 & 44 above, and further in view of Pilipovic (US 6,456,982)

Re. Claims 4, 12, 25, 31, 40 & 47, Eder discloses determining a present value of the future financial value stream by aggregating influences on the future financial value stream attributable to past events [C10 L41 to C12 L30; C17 L5 to C18 L12; C19 L3-L20]. Eder, explicitly, does not disclose determining a reliability index that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events. However, Pilipovic discloses determining a reliability index (projection distribution) that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events [Figure 14b, 14d; C1 L21 to C2 L50; C3 L30-L38; C16 L10-L16]. It would have been obvious at the time the invention was made to a person having ordinary skill in the art in financial reliability and risk assessment to modify the disclosure of Eder and include reliability index, as taught by Pilipovic, to calculate and predict the uncertain future value forecast and goal to meet.

Response to Arguments

2. In response to applicant's remark (page 1) recites "determine a present value of a future financial value stream" and applicant's remark (page 2) recites "Eder does not

determine the value of individual future financial value streams of a business enterprise ..."

Eder (col. 10 lines 40-67) discloses present value "PV" (well known annuity formula in example form) with assumed variables (investor's required interest rate) and (expected future cash flow in period t = 1,.., n). For example, a company is expecting to collect royalty for a brand name (Figure 14 – intangible value generating assets) for period of time, the company can calculate the future cash flow from this brand name in future based on assumed sale, interest rate, etc and reports this future income in its financial statement (Figure 15). Eder (col. 1 lines 19-22) discloses "impact of user-specified or system generated changes in business value drivers (income from brand name such as Coca Cola classic, Aqua, Canada Dry in different years with expected rate of return) on the other value drivers, ... enterprise.", which means that the impact of user-specified (assumed) changes in business value drivers (financial value streams) on the other value drivers (capital driver – figure 2 # 181) (revenue driver figure 2 # 179) of company.

Revisiting Eder's (col. 10 lines 40-67), which discloses "using the system described above, the value of the enterprise will be further broken down into tangible and intangible ***element***s of value (data structure with two elements). ... An integral part of most income valuation models is the calculation of the present value (present value is well known financial term, which is defined as the present worth of future sums of money) of the ***expected*** cash flows, income or profits associated with the current-operation. The present value of a stream of cash flows is calculated by discounting the

cash flows at a rate that reflects the risk associated with realizing the cash flow. For example, the present value (PV) of a cash flow of ten dollars ($10) per year for five (5) years would vary depending on the rate used for discounting future cash flows (future value annuity or future financial value stream) as shown below calculation of present value of $10 annuity at assumed discount value of 25% and 35%, which has future value of $26.89 at 25% discount rate and $22.20 at 35% discount rate.

Eder's disclosure of well known financial formula in example form for present value of an annuity can be found in any basic financial text book or can be derived from basic future value of investment compounded annually for series of payments, where

$$PV = F_1 \sum_{n=1}^{p} ([(1+i)^n])^{-1}$$

and further, it is well known to one of ordinary skill in the art of finance that change in interest rate has a single biggest impact on future value of incomes derived from annuities, mortgage and loans (from lender's prospective), etc. Particularly change in FED rate which may happen or not has the biggest impact on the market as well as companies (income/payments). This process can be repeated for every annuity at different interest rate and terms and investment,

$$PV = F_1 \sum_{n=1}^{p} ([(1+i)^n])^{-1} \quad F_2 \sum_{n=1}^{q} ([(1+j)^n])^{-1} + \ldots + \quad F_M \sum_{n=1}^{r} ([(1+k)^n])^{-1}$$

+

It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made that an financial company can use the above formula to calculate total annuities and reported on it balance sheet such as Eder's Figure 15 ("cash", "marketable securities", "brand names"). For example, a company wants to borrow money for company improvement, it can calculate the company's income from different brands to show the lender that the company is sound and is able to pay the lender based on above annuities income.

Applicant's remark (page 1) recites "developing a data structure ..." Eder's discloses the data structure for one business value driver (brand name) with two assumed variables (interest rate "i" and future value "F") or PV = f(F, i, n).

Applicant's claim read "one or more", which only one assume variable satisfies (change of "i" or "F") the claim limitation, and similarly "at least one future or, past event", discounting future cash flows satisfies this limitation. In reference to Eder's disclosure, two financial stream PV_1 = $26.89 and PV_2 = $22.20 will yield a total of $49.09. These streams can be expanded to other types of annuities, etc.

In response to applicant's remark (page 3) recites "Phillips fails to disclose modeling future value streams of a business enterprise based on the occurrence or non-occurrence of "events." Applicant argues about limitation "modeling" which is not claimed. Further, primary reference discloses this modeling (see abstract - Monte Carlo model), and future value streams as explained above.

In response to applicant's argument that (page 7) that "Examiner has not cited any objective evidence on record of a motivation ..." In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, estimate the present value of the expected firm (corporation, future value of commodity or an item) specific information (increase/decrease future value/income, sale, or etc.) [see Phillips provided reference; C25 L24-L36; C64 L36 to C66 L7] and predicting the uncertain future value of company [see Pilipovic provided reference; C1 L21 to C2 L50; C3 L30-L38; C16 L10-L16].

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harish T. Dass whose telephone number is 571-272-6793. The examiner can normally be reached on 8:00 AM to 4:50 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung S. Sough can be reached on 571-272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Harish T Dass
Examiner
Art Unit 3628

4/3/06

HYUNG SOUGH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600

Exhibit 2

MS: Appeal Brief - Patents
Commissioner for Patents
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Serial No.: 09/574,569 By: DLA/jh
Atty Dkt No.: 350725-991100 (2101197)
Filing Date: May 17, 2000
Title: CONTINUOUSLY UPDATED DATA PROCESSING SYSTEM FOR MEASURING FINANCIAL VALUE CREATION

Mail Date: October 10, 2006 Due Date: October 7, 2006

The following has been received in the U.S. Patent and Trademark Office on **October 10, 2006, via First Class Mail**:

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2. Fee Transmittal (+1);
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4. Brief for an Appeal after a Notice of Appeal mailed 7-7-06 (48 pgs) (+2);
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CERTIFICATE OF MAILING BY FIRST CLASS MAIL			Docket No. 350725-991100 (2101197)
Applicant: Robert I.G. McLEAN et al.			
Serial No. 09/574,569	Filing Date May 17, 2000	Examiner Harish T. Dass	Group Art Unit 3628

Invention: CONTINUOUSLY UPDATED DATA PROCESSING SYSTEM FOR MEASURING FINANCIAL VALUE CREATION

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	150

Application Number	09/574,569
Filing Date	May 17, 2000
First Named Inventor	Robert I.G. McLEAN et al.
Art Unit	3628
Examiner Name	Harish T. Dass
Attorney Docket Number	350725-991100 (2101197)

ENCLOSURES *(Check all that apply)*

- ☒ Fee Transmittal Form (+1)
  - ☒ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☒ Extension of Time Request (1 mo) (+1)
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
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- ☐ CD, Number of CD(s) _____
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- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
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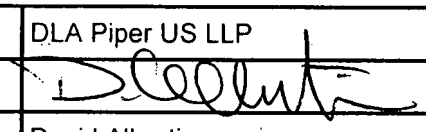
Signature			
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Date	October 10, 2006	Reg. No.	43,465

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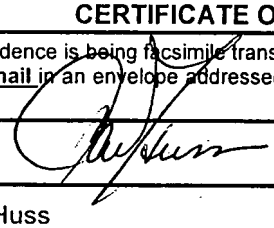
Signature			
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EM\7208602.1
350725-991100

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL for FY 2006

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($) 310.00

Complete If Known	
Application Number	09/574,569
Filing Date	May 17, 2000
First Named Inventor	Robert I.G. McLEAN et al.
Examiner Name	Harish T. Dass
Art Unit	3628
Attorney Docket No.	350725-991100 (2101197)

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☐ Deposit Account Deposit Account Number: 07-1896 Deposit Account Name: DLA Piper Rudnick Gray Cary US LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

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FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
		Small Entity		Small Entity		Small Entity	
Application Type	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		Extra Claims	Fee ($)		Fees Paid ($)
_____	- 20 or HP =	_____	x _____	=	_____

HP = highest number of total claims paid for, if greater than 20

Indep. Claims		Extra Claims	Fee ($)		Fees Paid ($)
_____	- 3 or HP =	_____	x _____	=	_____

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims	
Fee ($)	Fee Paid ($)
_____	_____

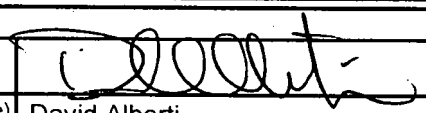
3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof		Fee ($)		Fee Paid ($)
_____	- 100 =	_____	/50=	_____	(round **up** to a whole number) x	_____	=	_____

4. OTHER FEE(S)

	Fee Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge): (Small Entity) Appeal Brief filing fee $250.00; Petition for Extension of Time (1 Mo.) $60.00	310.00

SUBMITTED BY			
Signature		Registration No. 43,465 (Attorney/Agent)	Telephone 650-833-2052
Name (Print/Type)	David Alberti		Date October 10, 2006

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U.S. Patent and Trademark Office; U.S. DEPARMENT OF COMMERCE

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) **FY 2006** **(fees effective on or after December 8, 2004)**	Docket Number (Optional) 350725-991100 (2101197)
Application Number 09/574, 569	Filed May 17, 2000
For: CONTINUOUSLY UPDATED PROCESSING SYSTEM FOR MEASURING FINANCIAL VALUE CREATION	
Art Unit 3628	Examiner Harish T. Dass

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	
☒	One month (37 CFR 1.17(a)(1))	$120	$60	$ 60.00
☐	Two months (37 CFR 1.17(a)(2))	$450	$225	$
☐	Three months (37 CFR 1.17(a)(3))	$1020	$510	$
☐	Four months (37 CFR 1.17(a)(4))	$1590	$795	$
☐	Five months (37 CFR 1.17(a)(5))	$2160	$1080	$

☐ Applicant claims small entity status. See 37 CFR 1.27.

☒ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 07-1896. I have enclosed a duplicate copy of this sheet.

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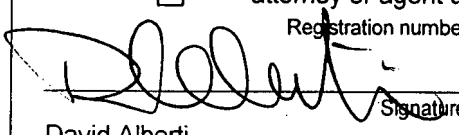
I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☒ attorney or agent of record. Registration Number 43,465

☐ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____.



Signature — October 10, 2006 (Date)

David Alberti (Typed or printed name) — (650) 833-2052 (Telephone Number)

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of forms are submitted.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of Robert I.G. MCLEAN, et al.

Application No. 09/574,569

Attorney Docket No. 350725-991100 (2101197)

Filed: May 17, 2000

For: CONTINUOUSLY UPDATED DATA PROCESSING SYSTEM FOR MEASURING FINANCIAL VALUE CREATION

Group Art Unit: 3628

Examiner: Dass, Harish T.

APPEAL BRIEF

2000 University Avenue
East Palo Alto, CA 94303-2248
(650) 833-2000

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October 10, 2006

Jan Huss

Dear Sir/Madam:

This is a brief for an appeal from a Final Office Action dated April 7, 2006, and from a Notice of Appeal that was filed on July 7, 2006. This brief is being filed with a petition for a one month extension of time.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee of this application, the Canadian Institute of Chartered Accountants.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals or interferences.

III. STATUS OF THE CLAIMS

The application was originally filed with Claims 1-52. Claims 1-52 remain pending and all stand rejected. This is an appeal of rejected Claims 1-52. Claims 1-52 are reproduced and attached in the Claims Appendix.

IV. STATUS OF AMENDMENTS

All offered amendments have been entered. The claims appear before the Board as they were finally rejected (Claims 1-52) and are attached in the Claims Appendix.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 recites a method of processing data relating to the performance of a business enterprise in creating value, the method comprising developing a data structure that includes assumed variables and, for each assumed variable, future or past events that influence the assumed variable. *See, e.g., Appellant's Specification as filed at p. 3, ll. 8-12; Figs. 7-9.* The method of Claim 1 further comprises determining a first present value of the future financial value stream by aggregating the influences attributable to the assumed variables and adjusting the future financial value stream for a time value of money. *See, e.g., id. at p. 3, ll. 12-15.* The method further comprises receiving data from a user indicating the occurrence or non-occurrence of one or more of the future events. *See, e.g., id. at p. 3, ll. 15-18.* The method further comprises determining, in response to the occurrence of one or more of the future events,

whether one of more of the assumed variables has changed and whether the future financial value stream has changed. *See, e.g., id.* The method further comprises determining a second present value of the future financial stream, taking into account any assumed variables that changed in response to the occurrence or non-occurrence of the future events. *See, e.g., id. at p. 3, ll. 18-20.*

Claim 9 also recites a method of processing data relating to the performance of a business enterprise in creating value, the method comprising developing a data structure that includes plurality of future financial value streams, where each future financial value stream has assumed variables that have an influence on a future financial value stream of the business enterprise, and where each assumed variable is linked to future or past events that influence the assumed variable. *See, e.g., id. at p. 3, ll. 21-25; Figs. 7-9.* The method of Claim 9 further comprises determining a present value for each future financial value stream by aggregating the influences attributable to the assumed variables and adjusting for a time value of money. *See, e.g., id. at p. 3, ll. 25-28.* The method further comprises aggregating the present value of each future financial value stream to form a first aggregate present financial value of the plurality of future financial value streams. *See, e.g., id. at p. 3, ll. 28-30.* The method further comprises receiving data from a user indicating the occurrence or non-occurrence of one or more of the future events. *See, e.g., id. at p. 3, l. 30 - p. 4, l. 2.* The method further comprises determining, in response to the occurrence of one or more of the future events, whether one of more of the assumed variables has changed and whether the future financial value stream has changed. *See, e.g., id.* The method further comprises forming a second aggregate present value of the plurality of future financial value streams taking into account any assumed variables that changed in response to the occurrence of non-occurrence of the future events. *See, e.g., id. at p. 4, ll. 2-5.*

Claim 17 also recites a method of processing data relating to the performance of a business enterprise in creating value, the method comprising developing a data structure that includes assumed variables and, for each assumed variable, future or past events that influence the assumed variable. *See, e.g., id. at p. 4, ll. 6-9; Figs. 7-9.* The method of Claim 17 further comprises determining a first present value of the future financial value stream as of a first specified date by aggregating the influences of the assumed variables and adjusting the future financial value stream for a time value of money. *See, e.g., id. at p. 4, ll. 9-12.* The method further comprises determining a second present value of the future financial value stream as of a second specified date in a similar manner. *See, e.g., id. at p. 4, ll. 12-16.* The method further comprises determining a variance between the first present value and the second present value taking into account a time value of money between the first and second dates. *See, e.g., id. at p. 4, ll. 16-17.* The method further comprises attributing the variance between the present values to events that occurred between the first and second specified dates. *See, e.g., id. at p. 4, ll. 17-19.*

Claim 21 also recites a method of processing data relating to the performance of a business enterprise in creating value, the method comprising selecting a stakeholder perspective for determining a present value of a future financial value stream. *See, e.g., id. at p. 4, ll. 20-23.* The method of Claim 21 further comprises developing a data structure that includes assumed variables that have an influence on the future financial value stream from the perspective of the selected stakeholder and, for each assumed variable, future or past events that influence the assumed variable. *See, e.g., id. at p. 4, ll. 23-26; Figs. 7-9.* The method further comprises determining a present value of the future financial value stream from the perspective of the selected stakeholder by aggregating the influences of the assumed variables and adjusting the future financial value stream for a time value of money. *See, e.g., id. at p. 4, ll. 26-30.*

Claim 29 also recites a method of processing data relating to the performance of a business enterprise in creating value, the method comprising developing a data structure that includes assumed variables and, for each assumed variable, future or past events that influence the assumed variable. *See, e.g., id. at p. 5, ll. 1-4; Figs. 7-9.* The method of Claim 29 further comprises identifying and segregating risks specific to the future financial value stream from risks specific to the business enterprise or industry as a whole. *See, e.g., id. at p. 5, ll. 4-6.* Probabilities are assigned to the events or assumed variables based on the identified risks. *See, e.g., id. at p. 5, ll. 6-7.* The method further comprises determining a first present value of the future financial value stream by aggregating the influences of the assumed variables, adjusting the future financial value stream by the assigned probability, and further adjusting the future financial value stream for a time value of money. *See, e.g., id. at p. 5, ll. 7-11.* The method further comprises receiving data from a user indicating the occurrence or non-occurrence of one or more of the future events. *See, e.g., id. at p. 5, ll. 11-13.* The method further comprises determining, in response to the occurrence of one or more of the future events, whether one of more of the assumed variables has changed and whether the future financial value stream has changed. *See, e.g., id.* The method further comprises determining a second present value of the future financial stream, taking into account any assumed variables that changed in response to the occurrence or non-occurrence of the future events. *See, e.g., id. at p. 5, ll. 13-16.*

Claim 37 also recites a method of processing data relating to the performance of a business enterprise in creating value, the method comprising developing a data structure that includes assumed variables and, for each assumed variable, future or past events that influence the assumed variable. *See, e.g., id. at p. 5, ll. 17-20; Figs. 7-9.* The method of Claim 37 further comprises determining a present value of the future financial value stream by aggregating the

influences of the assumed variables and adjusting the future financial value stream for a time value of money, wherein the events and assumed variables collectively form a base case scenario for the business enterprise and the first present value of the future financial value stream is based upon the base case scenario. *See, e.g., id. at p. 5, ll. 20-25.* One or more of the assumed variables is changed to form an alternate scenario including the changed assumed variables. *See, e.g., id. at p. 5, ll. 25-27.* The present value of the future financial stream is determined based upon the alternate scenario and is compared to the first present value based upon the base case scenario. *See, e.g., id. at p. 5, ll. 27-30.*

Claim 44 also recites a method of processing data relating to the performance of a business enterprise in creating value, the method comprising developing a data structure that includes assumed variables and, for each assumed variable, future or past events that influence the assumed variable. *See, e.g., id. at p. 5, ll. 1-5; Figs. 7-9.* The method of Claim 44 further comprises determining a first present value of the future financial value stream by aggregating the influences of the assumed variables, adjusting the future financial value stream by for a time value of money. *See, e.g., id. at p. 5, ll. 5-8.* A series of updated present values of the future financial value stream are repeatedly determined and presented. *See, e.g., id. at p. 5, ll. 8-9.* Each updated present value is determined from the events and assumed variables in the data structure, including any assumed variables that have changed in response to the occurrence or non-occurrence of the future events. *See, e.g., id. at p. 5, ll. 9-11.*

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are as follows:

1) Claims 1-3, 5-11, 13-24, 26-30, 32-39, 41-46, and 48-52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,321,205 to Eder, in view of U.S. Patent No. 6,792,399 to Phillips, et al.

2) Claims 4, 12, 25, 31, 40, and 47 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,321,205 to Eder, in view of U.S. Patent No. 6,792,399 to Phillips, et al., and in further view of U.S. Patent No. 6,456,982 to Pilipovic, et al.

VII. APPELLANT'S ARGUMENT

A. Claims 1-3, 5-11, 13-24, 26-30, 32-39, 41-46, and 48-52 are patentable over the combination of Eder and Phillips

The Examiner has rejected Claims 1-3, 5-11, 13-24, 26-30, 32-39, 41-46, and 48-52 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,321,205 to Eder (hereinafter "Eder"), in view of U.S. Patent No. 6,792,399 to Phillips, et al. (hereinafter "Phillips"). *Office Action of April 7, 2006 at p. 2.*

The Board should overturn these rejections because neither Eder nor Phillips, either alone or in combination, teach or suggest every element recited in each of the claims, because Phillips teaches away from claimed invention, and because there is no motivation or suggestion to combine the relevant teachings of Eder and Phillips.

1. The Examiner bases his rejections largely on his own supposition, and improperly supplements the record with statements and examples that do not appear in the prior art references and have no evidentiary support.

In the Final Office action of April 7, 2006, the Examiner repeatedly relies on his own conclusory statements and "examples" that have no evidentiary support on the record. This

contravenes Federal Circuit precedent. *In re Zurko,* 258 F.3d 1379 (Fed. Cir. 2001). The Examiner's improper attempts to supplement the record, as discussed below, should be summarily disregarded by the Board.

In order to support a proposed combination under §103, an Examiner must cite to objective evidence in the record. An examiner may not, because of doubt that the invention is patentable, resort to speculation, unfounded assumption or hindsight reconstruction to supply deficiencies in the factual basis for the rejection. *See In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 177 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968).* Moreover, as the MPEP warns, "It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known. For example, assertions of technical facts in the areas of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art." M.P.E.P. 2144.03 (emphasis in original). Further, "It is never appropriate to rely solely on 'common knowledge' in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based." *Id. citing In re Zurko*, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001).

Despite these well established principles, the Examiner has repeatedly supplemented the record with his own conjecture and statements. For example, at page 3, the Examiner cites a portion of Phillips and suggests it discloses a step admittedly missing from Eder relating to the determination of the present value of future financial value streams based on the occurrence or non-occurrence of one or more future events. *Office Action of April 7, 2006 at page 3-4.* Particularly, the Examiner states:

> Phillips discloses this step to [C25 L24-L36; C64 L36 to C66 L7 – see anticipated and unexpected] to estimate the present value of the expected firm (corporation, future value of commodity or an item) specific information (increase/decrease future value/income, sale or etc.) For example: Exxon's future value based on the war in Iraq if the war continues for another few years or stops next month/year. Similarly, the price of oil as a commodity, it well keeps increasing or fall once the war is over or OPEC will make changes to its production. Example 2: Price of US corn in international market depends on the weather and harvest in other countries and for future option prices some of the factors are assumed, it may happen or it may not. Example 3: No one in Merck Pharmaceutical new [sic] that their drug Vioxx will be off the market due to raised questions about **heart problems.** *Id. at pages 3-4.* (emphasis in original).

None of these examples appear in Phillips and appear to have been wholly the creation of the Examiner. Furthermore, none of these examples have any relation or correspondence to the "events" discussed in the citation of Phillips on which the Examiner relies. As discussed below in Sub-Section VII.A.3., these "prediction events" are contests in which multiple forecasters provide their predictions with respect to a stock. *See e.g., Phillips at col. 7, lines 24-67.*

The Examiner ends his analysis of claim 1 with a bare, conclusory assertion that it would have been obvious to modify the disclosure of Eder and include occurrence or non-occurrence of one or more of the future "events" in Phillips to analyze the impact of events on the future value of the corporation of a commodity. In doing so, the Examiner mischaracterizes the "events" of Phillips, fails to cite or even mention a motivation to combine the references, and improperly suggests that Eder could be modified to analyze the impact of events on the future value of a "commodity."[1] Such attempts to craft a rejection without evidentiary support must be summarily disregarded. *See also, for example, Office Action of April 7, 2006 at pp. 7-8, 15-16; In re Zurko, supra.*.

The Examiner's latest set of arguments rely even more heavily on his own conjecture and assumptions. *See id. at pp. 22-26.* For example, the Examiner impermissibly enhances the

[1] As discussed in Sub-Section A.2., Eder only discloses analyzing the present value of an entire business enterprise and does not discuss determining the value of individual value streams of an enterprise, much less a commodity.

disclosure of Eder when he, with no evidentiary support, characterizes business value drivers as including "income from brand name such as Coca Cola classic, Aqua, Canada Dry in different years with expected rate of return [sic]." *Id. at p. 23.* He goes on to say, with absolutely no evidentiary basis in the prior art or otherwise, "it is well known to one of ordinary skill in the art of finance that change in interest rate has a single biggest impact on future value of incomes derived from annuities, mortgage and loans (from lender's prospective), etc. [sic]." *Id. at p. 24.* His next sentence is also entirely unsupported by any evidence, prior art or otherwise, despite being a broad economic presumption, the accuracy of which is questionable at best: "Particularly change in FED rate which may happen or not has the biggest impact on the market as well as companies (income/payments) [sic]." *Id.* The Examiner's speculation continues with another "example" that has no support in the prior art and is wholly his own creation: "For example, a company wants to borrow money for company improvement, it can calculate the company's income from different brands to show the lender that the company is sound and is able to pay the lender based on above annuities [sic]." *Id. at p. 25.* Again, such attempts to craft a rejection without evidentiary support must be summarily disregarded.

2. Eder does not disclose the present invention's method of determining a present value of future financial value streams.

Each of the present application's independent claims include limitations regarding the determination of a present value of a future financial *value stream.*[2] Eder does not determine the

[2] *See, for example and without limitation,* Claim 1: "determining, by use of a computer system, a first present value of the future financial value stream of the business enterprise..."; Claim 9: "determining, by use of a computer system, a present value of each future financial value stream..."; Claim 17: "determining, by use of a computer system, a first present value of the future financial value stream of the business enterprise..."; Claim 21: "determining, by use of a computer system, a present value of the future financial value stream of the business enterprise..."; Claim 29: "determining, by use of a computer system, a first present value of the future financial value stream of the business enterprise..."; Claim 37: "determining, by use of a computer system, a present value of the future financial value stream of the business enterprise..."; Claim 44: "determining, by use of a computer system, a first present value of the future financial value stream of the business enterprise..."

value of individual future value streams of a business enterprise, but rather focuses on determining the overall worth of a business enterprise at a point in time. The Examiner has not cited any evidence that shows otherwise.

(a) Eder does not deal with future financial value streams as defined in the present invention

In the Examiner's April 7, 2006 Office Action, he discusses present value formulas generally (pages 23-25) and, without any supporting explanation, relates "business value drivers" in Eder to "financial value streams" of the present invention (page 23, "business value drivers (financial value streams)"). But there is no basis in Eder to associate business value drivers with financial value streams. Indeed, Eder shows that these two concepts are quite different.

The present invention focuses on the analysis of value streams. A value stream for a business enterprise is defined in the present specification as "an aggregation of financial and non-financial benefits flowing to the business and arising from a minimum set of activities that are necessary to give rise to the benefits." *Appellant's Specification as filed at p. 9, ll. 22-24.* The present specification points out that value streams can be historical or future, and financial or non-financial.

As an example of how a value stream works in the present invention, consider an individual drug that forms part of the portfolio of a pharmaceutical company. The value stream associated with that specific drug can be modeled as a stream of financial benefits flowing to the organization over time. In addition, if the drug happened to be a cure for cancer, there could also be non-financial benefits, such as enhancement of the company's reputation. In both cases, the value streams could be related to a minimum set of activities required to give rise to the benefits: in this case, the company's development and promotional activities related to the specific drug.

A model according to the present invention for such a pharmaceutical company would be concerned with analyzing the value streams associated with each individual drug in the company's portfolio.

The business value drivers in Eder, by contrast, are entirely different. Eder defines "value drivers" as the "item variables" and "item performance indicators" that drive revenue, expense, and changes in capital. (23:46-54) The "items variables" in Eder are, for example, "the numeric and date field data" in data records containing a customer number that falls within a pre-determined range of customer numbers. (24:9-17) These data records are retrieved from the business's primary databases including: the basic financial systems database, the operation management system database, the advanced financial system database, the sales management system database, the human resource information system database, and external databases found on the internet by item. (Eder at 24:1-9.) The "item performance indicators" are numbers calculated from these numeric and date fields. (Id. at 24:28-30.) For numeric data fields, the item performance indicators include cumulative total value, the period to period rate of change in value, the rolling average value, and the time lagged value of each numeric item variable. (Id. at 24:20-24.) For date fields, the item performance indicators include time since last occurrence, cumulative time since first occurrence, average frequency of occurrence, and the rolling average frequency of occurrence. All item variables and item performance indicators are stored in the revenue driver table. (Id. at 24:17-19, 30-33.)

In short, the value drivers in Eder are simply collections of data that are mined from company databases and represent past information and past transactions. As such, they are distinguishable from the future value streams in the present invention. The future value streams in the present invention are not created by mining data from company databases. Rather, their

creation depends on defining relationships between key variables and *future* events. In this respect, the value streams look toward future events rather than past transactions. Thus, the value streams cannot be analyzed simply by mining company databases for historical performance indicators. For example, a future value stream in the present invention might represent the benefits that will flow to a pharmaceutical company based on its development and promotion of a specific drug. These benefits would not be recorded in any company database because they have not yet materialized. By definition, a future financial value stream is influenced by future events not included in or contemplated by a value driver.

These differences are entirely consistent with the fundamentally different goals of Eder and the present invention. Eder focuses on calculating the valuation of tangible and intangible assets as a percentage of the *total valuation of an enterprise* as of a specific point in time. The present invention, by contrast, determines the value potential of individual future financial value streams of an enterprise over time.

In sum, the value streams of the present invention cannot be correlated with the value drivers in Eder. Therefore, Eder does not disclose future value streams as they are defined in the present invention.

(b) Eder does not disclose any methods for the analysis of individual value streams

Even if, *assuming arguendo*, Eder did disclose future value streams as they are defined in the present invention, it does not disclose any method for the analysis of those value streams. Eder breaks current-operation value down into three components: revenue value, expense value, and capital value. (Id. at 11:1-35.) Of these, the only component that could possibly bear any resemblance to a value stream as defined in the present invention is revenue value. But while expense value and capital value are further broken down into sub-components for analysis, Eder

specifically notes that "the revenue value is not subdivided." (Id. at 11:25-26.) Eder again notes that "there is only one revenue component per enterprise" and "each enterprise has: one revenue component." (Id. at 19:18-19; 19:21-22.) Although Eder contemplates replacing an "enterprise" with a division of that enterprise, it does not disclose breaking an enterprise down into individual value streams for analysis. Therefore, Eder does not disclose any methods for the analysis of a future financial value stream of an enterprise.

(c) Eder does not disclose the method for determining present value of a future value streams in the present invention

Even if, *assuming arguendo,* Eder did disclose a method for the analysis of a future value stream, it would not satisfy the limitations related to determining the present value of an individual value stream as set forth in any of the claimed inventions.

Claim 1 of the present application requires "determining, by use of the computer system, a first present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables," where "the assumed variables" refers to "one or more assumed variables that have an influence on a future financial value stream of the business enterprise" and where each assumed variable is tied to "at least one future or past event ... that influences the corresponding assumed variable." The application's other independent claims have similar limitations.

As explained in earlier amendments and responses that are incorporated by reference, the concept of "events" linked to assumed variables is entirely absent from Eder. The word "event" occurs only once in the Eder specification as one attribute of sales management systems. (15:39) There is no suggestion anywhere in Eder that the components of value, elements of value, or value drivers are in any way tied to events. In other words, there is no suggestion in Eder that any variables are linked to specific events, let alone an assertion, as in the present invention, *that*

each and every assumed variable is linked to one or more events. Indeed, the Examiner has conceded that "Eder does not explicitly disclose data indicating the occurrence or non-occurrence of one or more future events." *Office Action of April 7, 2006 at p. 3; Office Action of June 29, 2005 at p. 4.* If Eder does not disclose data indicating the occurrence or non-occurrence of events, it cannot tie such events to its value calculations.

This is consistent with the contrasting goals of Eder versus the present invention. Eder is focused on calculating a valuation of tangible and intangible assets in relation to an overall enterprise valuation as of a particular point in time. Eder, therefore, has little need for future events. The present invention, by contrast, is focused on analysis of changes in value potential of future financial value streams as events unfold over time.

Because Eder does not mention events in relation to the variables used in its methods, it does not disclose determining the present value of a future value stream by using assumed variables that are tied to "at least one future or past event."

(d) The present value formulas discussed by the Examiner do not remedy the deficiencies of Eder

The present value formulas discussed by the Examiner in the April 7, 2006 Office Action do not disclose determining the present value of future value streams using the methods claimed by the present application. Specifically, the Examiner's discussion of present value calculations does not link assumed variables to the concept of "events" as required by the claims of the present invention.

The discounting concepts and present value formulas discussed by the Examiner do little more than mirror the brief discussion of discounting in Eder at 10:40-67. Because Eder discloses neither a general method for analyzing an individual value stream nor a specific method of determining the present value of a future value stream by linking variables to events, the

Examiner's discounting discussion is also deficient in this regard to the extent that it mirrors Eder. Specifically, the Examiner's present value formulas do not link assumed variables to events.

The only part of the Examiner's discounting discussion purporting to overcome the deficiencies of Eder is the bare statement that "discounting future cash flows satisfies [the limitation requiring at least one future or past event to be associated with each assumed variable]." Examiner provides no support for this naked assertion and no explanation of how discounting future cash flows alone creates an event that is tied to an assumed variable that has an influence on a future value stream.

Indeed, the mere discounting of cash flows is disclosed in Eder itself: "discounting the cash flows at a rate that reflects the risk associated with realizing the cash flow." (10:48-49) And merely reciting a portion of a reference cannot overcome a deficiency of that same reference.

Overall, therefore, the Examiner merely discussed the basic present value formula from Eder at length. Accordingly, his discussion cannot overcome the deficiency in Eder of not disclosing the specific method of determining the present value of a future value stream by linking variables to events.

3. Phillips fails to disclose modeling future value streams of a business enterprise based on the occurrence or non-occurrence of "events"

All of the claimed inventions in the present application recite a unique relationship between future financial value streams and events. In the claimed inventions, each assumption (or "assumed variable") that is used to calculate a value stream is tied to one or more past or future events. The present invention may be described as being "event-driven," in that each assumption is linked to one or more past or projected events that have or are expected to

influence the related assumption.[3] An aspect of the analysis provided by the present invention is how the occurrence or non-occurrence of events changes the expected benefits associated with a value stream.

As noted above, the Examiner has conceded that Eder does not disclose data indicating the occurrence or non-occurrence of future events. The Examiner, however, has suggested that this feature is somehow disclosed by Phillips. Particularly, the Examiner says that "it would have been obvious to modify the disclosure of Eder and include the occurrence or non-occurrence of one or more future events, as disclosed by Phillips, to analyze the impact of events on the future value of the corporation or commodity." *Office Action of April 7, 2006 at pp. 3-4.* The Examiner's conclusion is incorrect, however, because Phillips does not disclose analyzing the impact of events on future financial value streams of a business enterprise.

Phillips relates to forecasting based on clusterization of forecasters into groups based on their predictions. This has no relevance to the claimed inventions, and in particular, to analyzing the impact of events on future financial value streams of a business enterprise. The Examiner's analysis of Phillips confuses the fundamental difference between a "prediction" and an "assumption," and is further based on a clear misunderstanding of the term "prediction event" as used in Phillips.

A "prediction" is a statement about the future that the predictor believes to be true. Someone making a prediction is in effect saying: "I believe that in the future the value of 'x'

[3] *See, for example and without limitation,* Claims 1, 17, 21, 29, 37, 44: "developing a data structure, by use of a computer system, including one or more assumed variables that have an influence on a/the future financial value stream of the business enterprise and *at least one future or past event linked to each assumed variable that influences the corresponding assumed variable*"; Claim 9: "developing a data structure, by use of a computer system, including a plurality of future financial value streams, each future financial value stream having one or more assumed variables that have an influence on a future financial value stream of the business enterprise *and at least one future or past event linked to each assumed variable that influences the corresponding assumed variable...*"

will be 'y'." For instance, a forecaster might predict that the stock price of XYZ Company will be $50 in three months time.

By contrast, an "assumption" (or "assumed variable") is postulated as a hypothesis. Someone who specifies an "assumed variable" in a model is in effect saying: "If I assume that the value of 'x' is 'y', what is the implication for 'z'"? For example, a mathematician might say: "if z = 3 + x, and I assume that the value of x = 2, then the implication is that z would equal 5." Clearly, in this example, the mathematician is not predicting that the value of x = 2, but rather exploring the implication for z of making that assumption.

The claimed inventions analyze value creation over time for the value streams of a business enterprise based on a data structure in which assumed variables are linked to one or more events. The purpose of linking the assumed variables to events is not to make "predictions" concerning the assumed variables, but rather to enable the users of the system to analyze the implications for the value creation potential of the enterprise as events occur or do not occur.[4]

Phillips does not disclose or suggest linking assumed variables to the occurrence or non-occurrence of one or more future events to analyze the impact of events on the future value of the corporation or commodity. By contrast, Phillips describes methods for combining the predictions of various forecasters into a combination forecast based on clustering the forecasters into groups based on statistical analysis related to the accuracy of prior forecasts.

[4] For example and without limitation, by linking each assumed variable to events, as one moves forward in time, it will eventually be possible to convert every variable in the data structure from an "assumption" to a "certainty." In other words, as the events specified in the data structure occur or do not occur, it becomes possible to adjust the linked "assumptions" to "actuals." The "calculation of a second present value of a future financial value stream taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events" is not based on a prediction. Rather, it is based on converting what was previously an "assumption" or hypothesis into an "actual", based on whether the event to which the assumed variable is linked occurred, or did not occur, in accordance with the assumptions in the data structure.

The first citation provided by the Examiner (C25, L24-36) is a commentary on Figure 5A of the Phillips specification, which shows a graph for predicting the value of a particular stock. *Office Action of April 7, 2006 at p. 3.* The cited text simply explains that the referenced graph includes historical values of the stock, and bands which indicate predicted future values of the stock. There is nothing in this cited reference that relates to linking assumed variables to events, or tracking the impact on the assumed variables of the occurrence or non-occurrence of events.

The second citation provided by the Examiner (C64, L36 to C66, L7) includes Claims 34, 35 and 36 of the Phillips specification. *Id.* The claims relate to methods for producing combination forecasts for a "prediction event," which is a contest or occasion in which multiple forecasters provide their predictions with respect to a value of a financial and/or economic measure.

Specifically, Phillips Claim 34 refers to methods in which the statistical data used to cluster the forecasters are calculated only with respect to the forecasters who have participated in a given prediction event (e.g., a contest).

Phillips Claim 35 refers to methods for providing combination forecasts from a group of forecasters based on clustering them into groups using statistical techniques based on their track record in previous prediction events or contests. Phillips Claim 36 refers to an apparatus that accomplishes the methods referred to in Claim 35.

There is no similarity whatsoever between the term "prediction event" used in Phillips, and the term "event" used in the claimed inventions. A prediction event in Phillips is an occasion, such as a contest, in which multiple forecasters make predictions concerning the same financial and/or economic measure. This is not relevant to the term "event" as used in the claimed inventions. For example, the "prediction events" in Phillips do not have any relation to

or effect on a future financial value stream of a business enterprise. Further, these "prediction events" are not linked to or influence any assumed variables in a data structure, as required by all of the claims in the present application.

Moreover, the emphasis in Phillips on ranking participants in prediction contests actually *teaches away* from the claimed invention. Phillips repeatedly encourages finding an accurate prediction by ranking individuals "based on their relative accuracies in individual prediction events." (*E.g.*, 6:50-61, 7:9-11, 32-33, 57-60) In other words, Phillips solicits predictions from multiple people and then chooses the most reliable prediction based on the accuracy of those people's past predictions. Phillips, therefore, finds reliability in predictions based on *past events* – the individuals' past performance. The more past predictions that are considered, the better Phillips can predict the reliability of a current prediction. Phillips's emphasis on past predictions is at odds with the claimed invention, which uses assumptions about *future events* to analyze the impact of those future events on a future financial value stream. In the claimed invention, the more *future events* that are considered (using assumed variables), the more reliable the analysis of the future financial stream. Thus, Phillips teaches away from the claimed invention.

The Examiner has provided no response to these deficiencies in Phillips other than a trivial attack on the applicant's one-time use of the word "modeling" to refer to the act of tying a future value stream to the occurrence or non-occurrence of one or more events. *Office Action of April 7, 2006 at p. 25; see Applicant's December 29, 2005 Response to Office Action at p. 3.* Regardless of whether tying events to a value stream in such a manner is best characterized as "modeling," "defining," "creating," "shaping," or "forming," the glaring deficiencies of Phillips remain. Phillips does not disclose analyzing the impact of events on future financial value streams of a business enterprise

In sum, the Examiner's tortured application of Phillips cannot supply any of the limitations that are missing from Eder concerning the relationship between events, assumed variables, and future financial value streams. For at least these reasons, Applicant requests that the Board overturn all rejections of the pending claims.

4. There is no suggestion or motivation for the proposed combination of Eder and Phillips.

The Examiner has failed to point to any suggestion or motivation in the prior art to combine the identified teachings of Eder and Phillips.

It is well-settled that "a showing of a suggestion, teaching, or motivation to combine [or modify] the prior art references is an 'essential component of an obviousness holding'." *C.R. Bard, Inc. v. M3 Systems, Inc.*, 157 F.3d 1340, 1352 (Fed. Cir. 1998). The Examiner can satisfy the burden of showing obviousness of the combination or modification "only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." *In re Fritch*, 972 F.2d 1260, 1265 (Fed. Cir. 1992). Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention. *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546 (Fed. Cir. 1998).

In rejecting Claims 1, 9, and 29 in light of Eder and Phillips, the Examiner says that "[i]t would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Eder and include occurrence or non-occurrence of one or more of the future events, as disclosed by Phillips, to analyze the impact of events on the future value of the corporation or a commodity." *Office Action of April 7, 2006 at pp. 4, 8, 15-16.* As discussed above, however, Phillips does not disclose modeling future value streams on the

occurrence or non-occurrence of events. Thus, there can be no motivation to combine Phillips with Eder in order to analyze the impact of events on future value streams because neither reference discloses such an analysis.

Moreover, even if some part of Phillips taught modeling future value streams on future events, the Examiner has still failed to provide any motivation to combine these two references. In attempting to point to a motivation to combine Eder and Phillips, the Examiner says that one would combine these references "[to] estimate the present value of the expected firm (corporation, future value of commodity or an item) specific information (increase/decrease future value/income, sale, or etc.) [see Phillips provided reference; C25 L24-L36; C64 L36 to C66 L7] [sic]." But this alleged motivation makes no reference to either the occurrence or non-occurrence of events or to analyzing the impact of events on future value streams. Indeed, as discussed above, the two citations to Phillips provided by the Examiner have nothing to do with analyzing future value streams based on the occurrence or non-occurrence of events. The Examiner has simply used Appellant's claims as a blueprint to selectively cull elements from the prior art and combine them in a failed attempt to fit the parameters of the claimed invention.

Because the Examiner has failed to point to any evidence of record showing a motivation to combine the identified features of Eder and Phillips, the Examiner has failed to satisfy his burden of showing *prima facie* obviousness of the combination of Eder and Phillips. Accordingly, the Board should overturn all rejections of the pending claims.

B. Claims 4, 12, 25, 31, 40, and 47 are patentable over the combination of Eder, Phillips, and Pilipovic

The Examiner has rejected Claims 4, 12, 25, 31, 40, and 47 under 35 U.S.C. § 103(a) as being unpatentable over Eder, in view of Phillips, and in further view of U.S. Patent No. 6,456,982 to Pilipovic, et al. (hereinafter "Pilipovic"). *Office Action of April 7, 2006 at p. 22.*

The Board should overturn these rejections because Eder and Phillips fail to teach the limitations of the related parent claims, because Pilopovic does not disclose the claimed "reliability index" and because there is no evidence of a motivation to combine Pilopovic with Eder and Phillips.

Pilipovic generally discloses a computer simulation system for generating and testing projected data. (7:50-62) The Examiner relies on Pilopovic, asserting that it "discloses a reliability index (projection distribution) that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events [Figure 14b, 14d; C1 L21 to C2 L50; C3 L30-L38; C16 L10-L16]." *Office Action of April 7, 2006 at p. 22.*

The cited Figure 14b refers to market price volatility measured over time, and the cited Figure 14d refers to market price correlations measured over time. Column 1, line 21 through column 2, line 50 describes the background of Pilipovic as being related to mathematical and statistical techniques used to estimate the likelihood of future events. Column 3, lines 30 to 38 refer to calculating a "probability distribution" of future cash flow which could be used to determine the price that one could pay today in order to receive an uncertain cash flow. Column 16, lines 10 to 16 refer to the possibility of constructing such a probability distribution based on a statistical analysis of historical forward price behavior.

None of these sections disclose the claimed reliability index "that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events" (*Claims 4, 25, 31, 40, and 47*) or the claimed reliability index "that is indicative of relative magnitudes of the second aggregate present value of the plurality of future financial value streams and an

aggregation of present values of the plurality of future financial value streams attributable to past transactions." *Claim 12*

In the claimed invention, the assumptions that are used to calculate the present value of a value stream are related to past or future events. It is therefore possible to separate out the assumptions that are linked to past events from those linked to future events. It is therefore further possible to calculate that portion of the present value of a value stream that is linked to past events from that portion of the present value stream that is linked to events that have not yet occurred.

For example, as noted in the pending application, "the reliability index may be determined from the following formula:

$$\text{reliability index} = PV_p/(PV_f + PV_p)$$

where PV_p is the PV attributable to past events (and related assumptions) and PV_f is the PV attributable to future events (and related assumptions). The higher the result (expressed as a fraction of 1), the greater the reliability of the estimate. It will be apparent that PV_f and PV_p may be combined in another way to determine a reliability index.

The reliability index provides a comparative indication of the degree to which calculated outcomes (e.g., present values) are attributable to assumptions based on events that have already occurred, versus assumptions based on future events. For example, if future sales projections are based on achieving a certain market share, and that market share has already been achieved, one would be inclined to place more reliance on those projections than if all required market gains were still in the future." *Appellant's Specification as filed at p. 26.*

The reliability index in the present invention is *not* an attempt to determine the probability of future events. It is not based on developing a probability distribution of future

events in order to make decisions. It does not "calculate and predict the uncertain future value forecast and goal to meet." *Office Action of April 7, 2006 at p. 22.*

Probability factors are used in the present invention to calculate the expected value of a value stream. But the use of probability factors in the present invention has nothing to do with the reliability index.

The reliability index in the present invention is a different concept. It differentiates between that portion of the present value of a value stream that is related to events that have already occurred, versus that portion of the present value that is related to events that are still to occur in the future.

The present invention's reliability index does not differentiate between future events with a higher or lower probability. The only thing that matters is the difference between events that have already occurred in the past (where then outcome is known), and events that are still to occur in the future, where the outcome is still unknown.

Consequently, Pilipovic does not disclose the claimed reliability index, and it cannot be concluded that "it would have been obvious at the time the invention was made to a person having ordinary skills in the art in financial reliability and risk assessment to modify the disclosure of Eder and include reliability index, as taught by Pilipovic." *Office Action of April 7, 2006 at p. 22.*

Moreover, the rejection of these claims is based on the assumption that their parent claims are unpatentable over Eder in view of Phillips. Because those parent claims are indeed patentable over Eder and Phillips, as discussed above, this assumption is false. Accordingly, the rejection of these claims in light of Eder, Phillips, and Pilipovic should be overturned.

Finally, there is no evidence of a motivation to combine Eder and Phillips, as discussed above, much less evidence of a motivation to combine Eder and Phillips and Pilipovic in the proposed manner. Accordingly, the Board should overturn the rejection of these claims. *C.R. Bard, supra.*

C. Conclusion

In view of the foregoing arguments, Claims 1-52 are patentable over Eder, Phillips, and Pilipovic, and all proposed combinations of those references.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account **No. 07-1896** referencing Attorney Docket **No. 350725-991100**. This paper is submitted in triplicate.

Respectfully submitted,

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CLAIMS APPENDIX

1. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing a data structure, by use of a computer system, including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event linked to each assumed variable that influences the corresponding assumed variable;

determining, by use of the computer system, a first present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money;

receiving as input into the computer system data from a user indicating the occurrence or non-occurrence of one or more of the future events;

determining, by use of the computer system and in response to the occurrence or non-occurrence of one or more of the future events, whether one or more of the assumed variables have changed and whether the influenced future financial value stream has changed; and

determining, by use of the computer system, a second present value of the future financial value stream taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events.

2. (original): The method according to claim 1, wherein determining the first present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized, and determining the second present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized taking into account an assessed probability that changed in response to the occurrence or non-occurrence of the one or more of the future events.

3. (original): The method according to claim 1, wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream.

4. (original): The method according to claim 1, further comprising:

determining a present value of the future financial value stream by aggregating influences on the future financial value stream attributable to past events; and

determining a reliability index that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events.

5. (original): The method according to claim 1, wherein the events and assumed variables collectively form a base case scenario for the business enterprise, and the first present value of the future financial value stream is based upon the base case scenario, the method further comprising:

changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables;

determining the present value of the future financial value stream based upon the alternate scenario; and

comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario.

6. (original): The method according to claim 1, further comprising selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream.

7. (original): The method according to claim 1, further comprising selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream.

8. (original): The method according to claim 1, wherein the first present value is determined with respect to a first date and the second present value is determined with respect to a second date, and the method further comprises:

determining a variance between the first present value and the second present value taking into account the time value of money between the first and second dates; and

attributing the variance between the first present value and the second present value to events that occurred between the first and second dates.

9. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing a data structure, by use of a computer system, including a plurality of future financial value streams, each future financial value stream having one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event linked to each assumed variable that influences the corresponding assumed variable;

determining, by use of the computer system, a present value of each future financial value stream by aggregating the influences on the future financial value stream attributable to the assumed variables of the future financial value streams and adjusting the future financial value streams for a time value of money;

aggregating the present value of each future financial value stream to form a first aggregate present financial value of the plurality of future financial value streams;

receiving as input into the computer system data from a user indicating the occurrence or non-occurrence of one or more of the future events;

determining, by use of the computer system and in response to the occurrence or non-occurrence of one or more of the future events for one or more of the future financial value streams, whether one or more of the assumed variables have changed and whether the influenced future financial value stream has changed; and

forming a second aggregate present value of the plurality of future financial value streams taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events.

10. (original): The method according to claim 9, wherein determining the present value of each future financial value stream further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized.

11. (original): The method according to claim 9, wherein each of the plurality of future financial value streams is associated with activities of the business enterprise necessary to give rise to the events associated with the corresponding future financial value stream.

12. (original): The method according to claim 9, further comprising:

determining a present value of each of the plurality of future financial value streams by aggregating influences on each of the future financial value streams attributable to past transactions; and

determining a reliability index that is indicative of relative magnitudes of the second aggregate present value of the plurality of future financial value streams and an aggregation of present values of the plurality of future financial value streams attributable to past transactions.

13. (original): The method according to claim 9, wherein the events and assumed variables for each of the plurality of future financial value streams collectively form a base case scenario for the business enterprise, and the first aggregate present value of the plurality of future financial value streams is based upon the base case scenario, the method further comprising:

changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables;

determining an aggregate present value of the plurality of future financial value streams based upon the alternate scenario; and

comparing the aggregate present value of the plurality of future financial value streams based upon the alternate scenario to the first aggregate present value of the plurality of future financial value streams based upon the base case scenario.

14. (original): The method according to claim 9 further comprising selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second aggregate present value of the plurality of future financial value streams.

15. (original): The method according to claim 9, further comprising selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second aggregate present value of the plurality of future financial value streams.

16. (original): The method according to claim 9, wherein the first aggregate present value is determined with respect to a first date and the second aggregate present value is determined with respect to a second date, and the method further comprises:

determining a variance between the first aggregate present value and the second aggregate present value taking into account the time value of money between the first and second dates; and

attributing the variance between the first aggregate present value and the second aggregate present value to events that occurred between the first and second dates.

17. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing a data structure, by use of a computer system, including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event linked to each assumed variable that influences the corresponding assumed variable;

determining, by use of the computer system, a first present value of the future financial value stream of the business enterprise as of a first specified date by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money;

determining, by use of the computer system, a second present value of the future financial value stream of the business enterprise as of a second specified date by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money;

determining, by use of the computer system, a variance between the first present value and the second present value taking into account a time value of money between the first and second dates; and

attributing the variance between the first present value and the second present value to events that occurred between the first and second specified dates.

18. (original): The method according to claim 17, wherein determining a first present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized, and determining the second present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized.

19. (original): The method according to claim 17, further comprising selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream.

20. (original): The method according to claim 17, further comprising:

determining a present value of each of a plurality of additional future financial value streams; and

aggregating the present value of the future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams

21. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining a present value of a future financial value stream of the business enterprise;

developing, by use of a computer system, a data structure including one or more assumed variables that have an influence on the future financial value stream of the business enterprise from the perspective of the selected stakeholder and at least one future or past event for linked to each assumed variable that influences the corresponding assumption; and

determining, by use of the computer system, a present value of the future financial value stream of the business enterprise from the perspective of the selected stakeholder by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money.

22. (original): The method according to claim 21, wherein determining the present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized.

23. (original): The method according to claim 21, wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream.

24. (original): The method according to claim 21, further comprising selecting one or more additional stakeholder perspectives from among the plurality of stakeholder perspectives for determining the first present value of the future financial value stream.

25. (original): The method according to claim 21, further comprising:

determining a present value of the future financial value stream by aggregating influences on the future financial value stream attributable to past events; and

determining a reliability index that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events.

26. (original): The method according to claim 21, wherein the events and assumed variables collectively form a base case scenario for the business enterprise, and the present value of the future financial value stream is based upon the base case scenario, the method further comprising:

changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables;

determining the present value of the future financial value stream based upon the alternate scenario; and

comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario.

27. (original): The method according to claim 21, further comprising:

determining a present value of each of a plurality of additional future financial value streams from the perspective of the selected stakeholder; and

aggregating the present value of the future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams.

28. (original): The method according to claim 21, further comprising repeatedly determining and presenting a series of updated present values of the future financial value stream, each updated present value determined from the events and assumed variables in the data structure including any assumed variables that have changed in response to the occurrence or non-occurrence of one or more of the future events.

29. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing a data structure, by use of a computer system, including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event linked to each assumed variable that influences the corresponding assumed variable;

identifying and segregating risks specific to the future financial value stream from risks specific to the business enterprise or industry as a whole;

assigning probabilities to the events or assumed variables based on the identified risks;

determining, by use of the computer system, a first present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables, adjusting the future

financial values stream by the assigned probabilities, and further adjusting the future financial value stream for a time value of money;

receiving as input into the computer system data from a user indicating the occurrence or non-occurrence of one or more of the future events;

determining, by use of the computer system and in response to the occurrence or non-occurrence of one or more of the future events, whether one or more of the assumed variables have changed and whether the influenced future financial value stream has changed; and

determining, by use of the computer system, a second present value of the future financial value stream taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events.

30. (original): The method according to claim 29, wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream.

31. (original): The method according to claim 29, further comprising:

determining a present value of the future financial value stream by aggregating influences on the future financial value stream attributable to past events; and

determining a reliability index that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events.

32. (original): The method according to claim 29, wherein the events and assumed variables collectively form a base case scenario for the business enterprise, and the first present value of the future financial value stream is based upon the base case scenario, the method further comprising:

changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables;

determining the present value of the future financial value stream based upon the alternate scenario; and

comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario.

33. (original): The method according to claim 29, further comprising selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream.

34. (original): The method according to claim 29, further comprising selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream.

35. (original): The method according to claim 29, wherein the first present value is determined with respect to a first date and the second present value is determined with respect to a second date, and the method further comprises:

determining a variance between the first present value and the second present value taking into account the time value of money between the first and second dates; and

attributing the variance between the first present value and the second present value to events that occurred between the first and second specified dates.

36. (original): The method according to claim 29, further comprising:

determining a present value of each of a plurality of additional future financial value streams; and

aggregating the present value of the first future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams.

37. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing, by use of a computer system, a data structure including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event linked to each assumed variable that influences the corresponding assumed variable;

determining, by use of the computer system, a present value of the future financial value stream of the business enterprise by aggregating the influences on the future

financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money, wherein the events and assumed variables collectively form a base case scenario for the business enterprise, and the first present value of the future financial value stream is based upon the base case scenario;

changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables;

determining, by use of the computer system, the present value of the future financial value stream based upon the alternate scenario; and

comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario.

38. (original): The method according to claim 37, wherein determining the present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the financial value stream will be realized.

39. (original): The method according to claim 37, wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream.

40. (original): The method according to claim 37, further comprising:

determining a present value of the future financial value stream by aggregating influences on the future financial value stream attributable to past events; and

determining a reliability index that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events.

41. (original): The method according to claim 37, further comprising selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the present value of the future financial value stream.

42. (original): The method according to claim 37, further comprising selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the present value of the future financial value stream.

43. (original): The method according to claim 37, further comprising:

determining a present value of each of a plurality of additional future financial value streams; and

aggregating the present value of the first future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams.

44. (previously presented): A computer-implemented method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing, by use of a computer system, a data structure including one or more assumed variables that have an influence on a future financial value stream of the

business enterprise and at least one future or past event linked to each assumed variable that influences the corresponding assumed variables;

determining, by use of the computer system, a first present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money; and

repeatedly determining and presenting a series of updated present values of the future financial value stream, each updated present value determined from the events and assumed variables in the data structure including any assumed variables that have changed in response to the occurrence or non-occurrence of one or more of the future events.

45. (original): The method according to claim 44, wherein determining the first present value and determining each updated present value further comprise adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized.

46. (original): The method according to claim 44, wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream.

47. (original): The method according to claim 44, further comprising:

determining a present value of the future financial value stream by aggregating influences on the future financial value stream attributable to past events; and

determining a reliability index that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events.

48. (original): The method according to claim 44, wherein the events and assumed variables collectively form a base case scenario for the business enterprise, and the first present value of the future financial value stream is based upon the base case scenario, the method further comprising:

changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables;

determining the present value of the future financial value stream based upon the alternate scenario; and

comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario.

49. (original): The method according to claim 44, further comprising selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream.

50. (original): The method according to claim 44, further comprising selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream

51. (original): The method according to claim 44, wherein the first present value is determined with respect to a first date and a selected one of the updated present values is determined with respect to a second date, and the method further comprises:

determining a variance between the first present value and the selected updated present value taking into account the time value of money between the first and second dates; and

attributing the variance between the first present value and the selected updated present value to events that occurred between the first and second dates.

52. (original): The method according to claim 44, further comprising:

determining a present value of each of a plurality of additional future financial value streams; and

aggregating the present value of the first future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams.

EVIDENCE APPENDIX

NONE

RELATED PROCEEDINGS APPENDIX

NONE

Exhibit 3

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/574,569	05/17/2000	Robert I.G. McLean	C1197-991100	7629

26379 7590 01/24/2007

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EXAMINER	
DASS, HARISH T	
ART UNIT	PAPER NUMBER
3693	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/24/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

CALENDARED
BY: ____
FOR: DLA
RESPONSE/EVENT:
Resp to OA
OPP: 24 April 2007 ADC
REPLY: 24 July 2007

Office Action Summary	Application No.	Applicant(s)	
	09/574,569	MCLEAN ET AL.	
	Examiner	Art Unit	
	Harish T. Dass	3693	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Attachement A*.

DETAILED ACTION

In view of the Appeal Brief filed on April 11, 2006, PROSECUTION IS HEREBY REOPENED.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final), or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

***.

1/17/07

SPE, Art Unit 3693

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 9, 17, 21, 29, 37, and 44, are rejected under 35 U.S.C. § 101 because the claimed invention is directed to a non-statutory subject matter. Claims 1-52 do not produce "concrete" results and have no utilities.

Independent claims 1, 9, 17, 21, 29, 37, and 44 have no tangible results, the claims stop without outputs and do not produce "concrete" end results with utilities.

Claim 1 has no tangible result, the claim stops at "determining, by use of the computer system, a second present value of the future financial value stream taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events. None of the limitations have been applied to produce a concrete result (i.e. No result is displayed, nothing is provide as a result of the process as an output, or etc,). Therefore, claim 1 has no tangible result and does not produce a concrete result with utility as of method claimed.

Claim 9 has no tangible result, the claim stops at "forming a second aggregate present value of the plurality of future financial value streams taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events". None of the limitations have been applied to produce a concrete result (i.e. No result is displayed, nothing is provide as a result of the process as an output, or etc,). Therefore, claim 9 has no tangible result and does not produce a concrete result with utility as of method claimed.

Claim 17 has no tangible result, the claim stops at "attributing the variance between the first present value and the second present value to events that occurred between the first and second specified dates". None of the limitations have been applied to produce a concrete result (i.e. No result is displayed, nothing is provide as a result of the process as an output, or etc,). Therefore, claim 17 has no tangible result and does not produce a concrete result with utility as of method claimed.

Claim 21 has no tangible result, the claim stops at "determining, by use of the computer system, a present value of the future financial value stream of the business enterprise from the perspective of the selected stakeholder by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money". None of the limitations have been applied to produce a concrete result (i.e. No result is displayed, nothing is provide as a result of the process as an output, or etc,). Therefore, claim 21 has no tangible result and does not produce a concrete result with utility as of method claimed.

Claim 29 has no tangible result, the claim stops at "determining, by use of the computer system, a second present value of the future financial value stream taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events". None of the limitations have been applied to produce a concrete result (i.e. No result is displayed, nothing is provide as a result of the process as an output, or etc,). Therefore, claim 29 has no tangible result and does not produce a concrete result with utility as of method claimed.

Claim 37 has no tangible result, the claim stops at "comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario". None of the limitations have been applied to produce a concrete result (i.e. No result is displayed, nothing is provide as a result of the process as an output, or etc,). Therefore, claim 37 has no tangible result and does not produce a concrete result with utility as of

method claimed.

Claim 44 has no tangible result, the claim stops at "repeatedly determining and presenting a series of updated present values of the future financial value stream, each updated present value determined from the events and assumed variables in the data structure including any assumed variables that have changed in response to the occurrence or non-occurrence of one or more of the future events". None of the limitations have been applied to produce a concrete result (i.e. No result is displayed, nothing is provide as a result of the process as an output, or etc,). Therefore, claim 44 has no tangible result and does not produce a concrete result with utility as of method claimed.

The unknown results of applicant's invention is clearly not the same results found in State Street Bank & Trust Co. V. Signature Financial group, Inc., 149 F 3d 1371, 47 USPQ 2d 1599 decided by the U.S. Courts of Appeals. "Today we hold the transformation of data representing discrete dollar amounts by a machine through a series of mathematical calculations into a final share price constitutes a practical application of a mathematical algorithm, formula or calculation because it produces a useful, concrete and tangible result, a final share price momentarily fixed for recording and reporting purposes". In the State Street case the "concrete, tangible, and useful results" is allocating money to different funds.

In the AT&T v. Excel Communications the useful, concrete, and tangible results is the claimed step of "producing message record for long distance telephone calls, enhanced by addition of Primary Interexchange Carrier (PIC) indicator". The system performs

different calculations and the result facilitates differential billing of calls made by the subscriber to long distance service carrier.

In the present application, the disclosure is nothing more than generalities as to various basic financial calculations (present value/future value). However, the disclosure is short on specifics as to explicitly how the result is used. Therefore, it is clear from the definition of "concrete" and the claimed limitations of the present invention mentioned above that the disclosure of the present invention is nothing more than generalizations regarding the various determination, and it is short on any particular or specific direction or guidance in achieving the desired results and in providing a concrete result which should be useful. Consequently, the claims are analyzed based upon the underlying process and thus rejected as being directed to a non-statutory process.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5-11, 13-24, 26-30, 32-39, 41-46 and 48-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandretto (US 5,812,988).

Re. Claim 1, Sandretto discloses developing a data structure including one or more assumed variables that have an influence on a future financial value stream of the

business enterprise and at least one future or, past event for each assumed variable that influences the corresponding assumed variable [Figures 1 (#10, 30,50), 2 (#180, 190, 250), col. 9 lines 46-55, col. 10 lines 9-23 (coupon rate, interest payment date, maturity date, etc.)],

determining a first present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money [Figure 2 (#250, 260), col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30 (projected cash flows ... NPV's is determined for first bond), (cash flows for each segment and each bond issue of a company are summed)],

determining a second present value of the future financial value stream taking into account the one or more assumed variables [col. 10 lines 9-23, col. 19 line 63 to col. 20 line].

Sandretto implicitly discloses determining, in response to the occurrence (inflation may rise/fall (see adjusting inflation), interest may go up/down (adjusting interest), economy may grow, default premiums) or non-occurrence of one or more of the future events, whether one or more of the assumed variables have changed and whether the influenced future financial value stream has changed [see Figure 2 (# 200, 290-324), col. 2 lines 44-59, col. 3 lines 8-38, col. 6 lines 14-30, col. 10 lines 44-48, etc], and

determining a second present value of the future financial value stream (additional set) taking into account the one or more assumed variables that changed in

response to the occurrence (inflation may rise/fall, interest may go up/down, economy may grow, default premiums) or non-occurrence of the one or more of the future events (inflation may rise/fall, interest rate may go up/down) [col. 2 lines 44-59, col. 3 lines 8-38, col. 10 44-48, etc]. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Sandretto and include empirical analysis of iterative and regression process and calculate variance of simulated variables (adjusting it to + -) that influence the returns on each type assets and optimize allocation of the assets or funds.

Re. Claim 2, Sandretto discloses wherein determining the first present value further comprises adjusting the future financial value stream by an assessed probability (likelihood) that the influences on the future financial value stream will be realized, and determining the second present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized taking into account an assessed probability that changed in response to the occurrence or non-occurrence of the one or more of the future events [col. 6 line 60 to col. 15, col. 14 line 30 to col. 15 line 19].

Re. Claim 3, Sandretto discloses wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream [col. 34 line 51 to col. 35 line 33].

Re. Claim 5, Sandretto discloses changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables, determining the present value of the future financial value stream based upon the alternate scenario, and comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario [Figure 1 (#130-164), col. 19 lines 24-45, Col. 2 lines 44-59, col. 36 lines 32-51].

Re. Claim 6, Sandretto discloses further comprising selecting a stakeholder perspective (financial statements, balance sheet) from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream [Figures 11-14, col. 34 lines 6-50, col. 36-52, col. 38 lines 20-35].

Re. Claim 7, Sandretto discloses further comprising selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream [Figures 11-14, col. 34 lines 6-50, col. 36-52 (see book values, financial statements, income statement)].

Re. Claim 8, Sandretto discloses determining a variance between the first present value and the second present value taking into account the time value of money between the first and second dates, and attributing the variance between the first present value and

the second present value to events that occurred between the first and second dates [col. 29 lines 52-64, col. 30 lines 5-53, col. 39 lines 42-51].

Re. Claim 9, Sandretto discloses developing a data structure including a plurality of future financial value streams, each future financial value stream having one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event for each assumed variable that influences the corresponding assumed variable [Figures 1 (#10, 30,50), 2 (#180, 190, 250), col. 9 lines 46-55, col. 10 lines 9-23],

determining a present value of each future financial value stream by aggregating the influences on the future financial value stream attributable to the assumed variables of the future financial value streams and adjusting the future financial value streams for a time value of money [Figure 2 (#250, 260), col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30 - (see cash flows for each segment and each bond issue of a company are summed)],

aggregating the present value of each future financial value stream to form a first aggregate present financial value of the plurality of future financial value streams [Figures 13-14 (cashflows), col. 20 lines 52-60, col. 35 lines 36-42],

Sandretto implicitly discloses determining, in response to the occurrence (inflation may rise/fall, interest may go up/down, economy may grow, default premiums) or non-occurrence of one or more of the future events for one or more of the future financial value streams, whether one or more of the assumed variables have changed and

whether the influenced future financial value stream has changed [Figure 2 (# 200, 290-324), col. 2 lines 44-59, col. 3 lines 8-38, col. 6 lines 14-30, col. 10 lines 44-48, etc], and

forming a second aggregate present value of the plurality of future financial value streams (additional set) taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events [col. 2 lines 44-59, col. 3 lines 8-38, col. 10 44-48, col. 23 lines 12-24, etc]. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Sandretto and include iterative and regression process and calculate variance of simulated variables (adjusting it to +-) that influence the returns on each type assets and optimize allocation of the assets or funds.

Re. Claim 10, Sandretto discloses wherein determining the present value of each future financial value stream further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized [col. 6 line 60 to col. 15, col. 14 line 30 to col. 15 line 19].

Re. Claim 11, Sandretto discloses wherein each of the plurality of future financial value streams is associated with activities of the business enterprise necessary to give rise to the events associated with the corresponding future financial value stream [col. 34 line 51 to col. 35 line 33].

Re. Claim 13, Sandretto discloses changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables,

determining an aggregate present value of the plurality of future financial value streams based upon the alternate scenario, and

comparing the aggregate present value of the plurality of future financial value streams based upon the alternate scenario to the first aggregate present value of the plurality of future financial value streams based upon the base case scenario [Figure 1 (#130-164), col. 19 lines 24-45, Col. 2 lines 44-59, col. 36 lines 32-51].

Re. Claim 14, Sandretto discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second aggregate present value of the plurality of future financial value streams [col. 34 lines 6-50, col. 36-52].

Re. Claim 15, Sandretto discloses selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second aggregate present value of the plurality of future financial value streams [Figures 11-14, col. 34 lines 6-50, col. 36-52 (book value)].

Re. Claim 16, Sandretto discloses determining a variance between the first aggregate present value and the second aggregate present value taking into account the time value of money between the first and second dates, and attributing the variance

between the first aggregate present value and the second aggregate present value to events that occurred between the first and second dates [col. 29 lines 52-64, col. 30 lines 5-53, col. 39 lines 42-51].

Re. Claim 17, Sandretto discloses developing a data structure including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event for each assumed variable that influences the corresponding assumed variable [Figures 1 (#10, 30,50), 2 (#180, 190, 250), col. 9 lines 46-55, col. 10 lines 9-23],

determining a first present value of the future financial value stream of the business enterprise as of a first specified date by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money [Figure 2 (#250, 260), col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30],

determining a second present value of the future financial value stream of the business enterprise as of a second specified date by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money [col. 10 lines 9-23, col. 19 line 63 to col. 20 line],

determining a variance between the first present value and the second present value taking into account a time value of money between the first and second dates [col. 29 lines 52-64, col. 30 lines 5-53, col. 39 lines 42-51, col. 24 line 56 to col. 25 line 5].

Sandretto implicitly discloses attributing the variance between the first present value and the second present value to events that occurred between the first and second specified dates [col. 24 line 56 to col. 25 line 5, col. 29 lines 52-64, col. 30 lines 5-53, col. 39 lines 42-51]. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Sandretto and include empirical analysis of iterative and regression process and calculate variance for specific dates to achieve the objective of particular analysis and business requirement.

Re. Claim 18, Sandretto discloses determining a first present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized, and determining the second present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized [col. 6 line 60 to col. 15, col. 14 line 30 to col. 15 line 19].

Re. Claim 19, Sandretto discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream [col. 34 lines 6-50, col. 36-52].

Re. Claim 20, Sandretto discloses determining a present value of each of a plurality of additional future financial value streams [col. 22 line 27 to col.23line 43], and

aggregating the present value of the future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams [Figure 2 (#250, 260), col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30].

Re. Claim 21, Sandretto discloses historical data may be used to determine a company's financing behavior [col. 38 lines 33-35],

developing a data structure including one or more assumed variables that have an influence on the future financial value stream of the business enterprise from the perspective of the selected stakeholder and at least one future or past event for each assumed variable that influences the corresponding assumption [Figures 1 (#10, 30,50), 2 (#180, 190, 250), col. 9 lines 46-55, col. 10 lines 9-23 (coupon rate, interest payment date, maturity date, etc.), col. 18 lines 35-63 (evaluating bonds), col. 38 lines 29-35], and

determining a present value of the future financial value stream of the business enterprise from the perspective of the selected stakeholder by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money [Figure 2 (#250, 260), col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30 (projected cash flows ... NPV's is determined for first bond)].

Sandretto implicitly discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining a present value of a future financial

value stream of the business enterprise [Figures 10-14, col. 38 lines 20-52]. It would have been obvious at the time the invention was made in order to use the enterprise financial statement, the analyst must select the perspectives of companies that are interest to the analyst (business choice) based on the analyst knowledge and information. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Sandretto and include a condition for selecting perspective of companies that meet certain business criteria interested to the analyst.

Re. Claim 22, Sandretto discloses wherein determining the present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the future financial value stream will be realized [col. 6 line 60 to col. 15, col. 14 line 30 to col. 15 line 19].

Re. Claim 23, Sandretto discloses wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream [col. 34 line 51 to col. 35 line 33].

Re. Claim 24, Sandretto discloses 24. The method according to claim 21, further comprising selecting one or more additional stakeholder perspectives from among the plurality of stakeholder perspectives for determining the first present value of the future financial value stream [Figures 11-14, col. 34 lines 6-50, col. 36-52, col. 38 lines 20-35].

Re. Claim 26, Sandretto discloses changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables, determining the present value of the future financial value stream based upon the alternate scenario, and comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario [Figure 1 (#130-164), col. 19 lines 24-45, Col. 2 lines 44-59, col. 36 lines 32-51].

Re. Claim 27, Sandretto discloses determining a present value of each of a plurality of additional future financial value streams from the perspective of the selected stakeholder [Figures 11-14, col. 34 lines 6-50, col. 36-52, col. 38 lines 20-35], and aggregating the present value of the future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams [col. 2 lines 44-59, col. 3 lines 8-38, col. 10 44-48, col. 23 lines 12-24, etc – see also total cash].

Re. Claim 28, Sandretto discloses repeatedly (iteratively) determining and presenting a series of updated present values of the future financial value stream, each updated present value determined from the events and assumed variables in the data structure [Figure 3, col. 3 lines 8-26, col. 13 lines 1-8 – see iterative process, interest rate, inflation, cashflow]. Sandretto implicitly discloses including any assumed variables that

have changed in response to the occurrence (inflation may rise/fall (see adjusting inflation), interest may go up/down (adjusting interest), economy may grow, default premiums) or non-occurrence of one or more of the future events [Figure 2 (# 200, 290-324), col. 2 lines 44-59, col. 3 lines 8-38, col. 6 lines 14-30, col. 10 lines 44-48, etc]. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Sandretto and include empirical analysis of iterative and regression process and calculate variance of simulated variables (adjusting it to +-) that influence the returns on each type assets and optimize allocation of the assets or funds.

Re. Claim 29, Sandretto discloses developing a data structure including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event for each assumed variable that influences the corresponding assumed variable [Figures 1 (#10, 30,50), 2 (#180, 190, 250), col. 9 lines 46-55, col. 10 lines 9-23 (coupon rate, interest payment date, maturity date, etc.)],

identifying and segregating risks specific to the future financial value stream from risks specific to the business enterprise or industry as a whole [col. 37 lines 35-49],

assigning probabilities to the events or assumed variables based on the identified risks [col. 37 lines 35-67, col. 6 line 60 to col. 15, col. 14 line 30 to col. 15 line 19 – see assumed variables and risk of interest rate or inflation],

determining a first present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables, adjusting the future financial values stream by the assigned probabilities, and further adjusting the future financial value stream for a time value of money [Figure 2 (#250, 260), col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30],

Sandretto implicitly discloses determining, in response to the occurrence or non-occurrence of one or more of the future events, whether one or more of the assumed variables have changed and whether the influenced future financial value stream has changed, and

determining a second present value of the future financial value stream taking into account the one or more assumed variables that changed in response to the occurrence or non-occurrence of the one or more of the future events [see Figure 2 (# 200, 290-324), col. 2 lines 44-59, col. 3 lines 8-38, col. 6 lines 14-30, col. 10 lines 44-48, etc]. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Sandretto and include empirical analysis of iterative and regression process and calculate variance of simulated variables (adjusting it to +-) that influence the returns on each type assets and optimize allocation of the assets or funds.

Re. Claim 30, Sandretto discloses wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream [col. 34 line 51 to col. 35 line 33].

Re. Claim 32, Sandretto discloses changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables, determining the present value of the future financial value stream based upon the alternate scenario, and comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario [Figure 1 (#130-164), col. 19 lines 24-45, Col. 2 lines 44-59, col. 36 lines 32-51].

Re. Claim 33, Sandretto discloses selecting a stakeholder perspective (financial statement, balance sheet) from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream [Figures 11-14, col. 34 lines 6-50, col. 36-52, col. 38 lines 20-35].

e. Claim 34, Sandretto discloses selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream [Figures 11-14, col. 34 lines 6-50, col. 36-52 (see book values, financial statements, income statement)].

Re. Claim 35, Sandretto discloses determining a variance between the first present value and the second present value taking into account the time value of money between the first and second dates, and attributing the variance between the first present value and the second present value to events that occurred between the first and second specified dates [col. 29 lines 52-64, col. 30 lines 5-53, col. 39 lines 42-51].

Re. Claim 36, Sandretto discloses determining a present value of each of a plurality of additional future financial value streams [col. 22 line 27 to col.23line 43], and aggregating the present value of the first future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams [col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30].

37. A method of processing data relating to the performance of a business enterprise in creating value, comprising:

developing a data structure including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event for each assumed variable that influences the corresponding assumed variable [Figures 1 (#10, 30,50), 2 (#180, 190, 250), col. 9 lines 46-55, col. 10 lines 9-23 (coupon rate, interest payment date, maturity date, etc.)],

determining a present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable

to the assumed variables and adjusting the future financial value stream for a time value of money, wherein the events and assumed variables collectively form a base case scenario for the business enterprise, and the first present value of the future financial value stream is based upon the base case scenario [Figure 2 (#250, 260), col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30 - (see cash flows for each segment and each bond issue of a company are summed), see step 1330],

changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables, determining the present value of the future financial value stream based upon the alternate scenario, and comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario [Figure 1 (#130-164), col. 19 lines 24-45, Col. 2 lines 44-59, col. 36 lines 32-51, see step 1330].

Re. Claim 38, Sandretto discloses wherein determining the present value further comprises adjusting the future financial value stream by an assessed probability that the influences on the financial value stream will be realized [col. 6 line 60 to col. 15, col. 14 line 30 to col. 15 line 19].

Re. Claim 39, Sandretto discloses wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream [col. 34 line 51 to col. 35 line 33].

Re. Claim 41, Sandretto discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the present value of the future financial value stream [col. 34 lines 6-50, col. 36-52].

Re. Claim 42, Sandretto discloses selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the present value of the future financial value stream [col. 34 lines 6-50, col. 36-52].

Re. Claim 43, Sandretto discloses determining a present value of each of a plurality of additional future financial value streams [col. 22 line 27 to col.23line 43], and

aggregating the present value of the first future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams [Figure 2 (#250, 260), col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30].

Re. Claim 44, Sandretto discloses developing a data structure including one or more assumed variables that have an influence on a future financial value stream of the business enterprise and at least one future or past event for each assumed variable that influences the corresponding assumed variables [Figures 1 (#10, 30,50), 2 (#180, 190, 250), col. 9 lines 46-55, col. 10 lines 9-23 (coupon rate, interest payment date, maturity date, etc.), col. 18 lines 35-63 (evaluating bonds), col. 38 lines 29-35],

determining a first present value of the future financial value stream of the business enterprise by aggregating the influences on the future financial value stream attributable to the assumed variables and adjusting the future financial value stream for a time value of money [Figure 2 (#250, 260), col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30], and

repeatedly determining and presenting a series of updated present values of the future financial value stream, each updated present value determined from the events and assumed variables in the data structure [Figure 3, col. 3 lines 8-26, col. 13 lines 1-8 – see iterative process, interest rate, inflation, cashflow]. Sandretto implicitly discloses including any assumed variables that have changed in response to the occurrence (inflation may rise/fall (see adjusting inflation), interest may go up/down (adjusting interest), economy may grow, default premiums) or non-occurrence of one or more of the future events [Figure 2 (# 200, 290-324), col. 2 lines 44-59, col. 3 lines 8-38, col. 6 lines 14-30, col. 10 lines 44-48, etc]. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the disclosure of Sandretto and include empirical analysis of iterative and regression process and calculate variance of simulated variables (adjusting it to +-) that influence the returns on each type assets and optimize allocation of the assets or funds.

Re. Claim 45, Sandretto discloses wherein determining the first present value and determining each updated present value further comprise adjusting the future financial

value stream by an assessed probability that the influences on the future financial value stream will be realized [col. 6 line 60 to col. 15, col. 14 line 30 to col. 15 line 19].

Re. Claim 46, Sandretto discloses wherein the future financial value stream is associated with activities of the business enterprise necessary to give rise to the events associated with the future financial value stream [col. 34 line 51 to col. 35 line 33].

Re. Claim 48, Sandretto discloses changing one or more of the assumed variables, to form an alternate scenario including the changed assumed variables, determining the present value of the future financial value stream based upon the alternate scenario, and comparing the present value of the future financial value stream based upon the alternate scenario to the first present value of the future financial value stream based upon the base case scenario [Figure 1 (#130-164), col. 19 lines 24-45, Col. 2 lines 44-59, col. 36 lines 32-51].

Re. Claim 6, Sandretto discloses selecting a stakeholder perspective from among a plurality of stakeholder perspectives for determining the first and second present values of the future financial value stream [Figures 11-14, col. 34 lines 6-50, col. 36-52, col. 38 lines 20-35].

Re. Claim 50, Sandretto discloses selecting two or more stakeholder perspectives from among a plurality of stakeholder perspectives for determining the first and second

present values of the future financial value stream [Figures 11-14, col. 34 lines 6-50, col. 36-52 (see book values, financial statements, income statement)].

Re. Claim 51, Sandretto discloses determining a variance between the first present value and the selected updated present value taking into account the time value of money between the first and second dates, and attributing the variance between the first present value and the selected updated present value to events that occurred between the first and second dates [col. 29 lines 52-64, col. 30 lines 5-53, col. 39 lines 42-51].

Re. Claim 52, Sandretto discloses determining a present value of each of a plurality of additional future financial value streams, and aggregating the present value of the first future financial value stream and the plurality of additional future financial value streams to form an aggregate present financial value of future financial values streams [Figure 2 (#250, 260), col. 19 line 63 to col. 20 line, col. 26 line 58 to col. 27 line 30].

Claims 4, 12, 25, 31, 40 & 47 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Sandretto as applied to claims 1, 9, 21, 29, 37 & 44 above, in view of Pilipovic (US 6,456,982).

Re. Claims 4, 12, 25, 31, 40 & 47, Sandretto discloses determining a present value of the future financial value stream by aggregating influences on the future financial value

stream attributable to past events [col. 8 lines 21-35, col. 34 lines 67]. Sandretto explicitly, does not disclose determining a reliability index that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events. However, Pilipovic discloses determining a reliability index (projection distribution) that is indicative of relative magnitudes of the present value of the future financial value stream attributable to past events and the present value of the future financial value stream attributable to future events [Figure 14b, 14d, col. 1 line 21 to col. 2 line 50, col. 3 lines 30-38, col. 16 lines 10-16]. It would have been obvious at the time the invention was made to a person having ordinary skill in the art in financial reliability and risk assessment to modify the disclosure of Sandretto and include reliability index, as taught by Pilipovic, to calculate and predict the uncertain future value forecast and goal to meet.

Response to Arguments

3. Applicant's arguments with respect to pending claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. This rejection is a result of appeal conference, which decided to open prosecution because of problem as stated in rejection of USC 101.

The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. Applicant is required under 37 CFR ' 1.111 (c) to consider the references fully when responding to this action.

US 2005/0119922 (Eder) discloses an automated system and method for analyzing, modeling and valuing elements of a business enterprise on a specified valuation date.The performance of the elements are analyzed using search algorithms and induction algorithms to determine the value drivers associated with each element. The induction algorithms are also used to create composite variables that relate element performance to enterprise revenue, expenses and changes in capital. Predictive models are then used to determine the correlation between the value drivers and the enterprise revenue, expenses and changes in capital. The correlation percentages for each value driver are then multiplied by capitalized value of future revenue, expenses and changes in capital, the resulting numbers for each value driver associated with each element are then added together to calculate a value for each element.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harish T. Dass whose telephone number is 571-272-6793. The examiner can normally be reached on 8:00 AM to 4:50 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James A. Kramer can be reached on 571-272-6783. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Harish T Dass
Examiner
Art Unit 3693

Harish T Dass

01/06/2007

Attachment A

Requirement for Information Under 37 C.F.R. § 1.105

1. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

2. In view of the nature of Applicant's attorney assertion during interview (paper # 20061130), a question of public use under 35 U.S.C. 102(b) is raised. Review of the prior art by Eder (see conclusion above) discloses valuing enterprise which accounts for future value of the company that includes future income projections and liabilities.

3. The information is required to identify products and/or services embodying the disclosed subject matter of providing bases for evaluating present application. In response to this requirement please provide any known publications, papers, brochures, accounting texts, manual and press releases that describe the "present value", "future value", corporation projection, re-assessing projections, and calculating aggregating future collectable (for example, mortgage companies calculations of stream of collectible for 3 months, 6 months, 1 year, 5 years, 30 years etc.) Examiner search has found document that shows calculating future value as prior art, see bellow.

4. The fee and certification requirements of 37 CFR 1.97 are waived for those documents submitted in reply to this requirement. This waiver extends only to those documents within the scope of the requirement under 37 CFR 1.105 that are included in the applicant's first complete communication responding to this requirement. Any

The Valuation of Cash Flow Forecasts: An Empirical Analysis

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The Valuation of Cash Flow Forecasts: An Empirical Analysis

STEVEN N. KAPLAN and RICHARD S. RUBACK*

ABSTRACT

This article compares the market value of highly leveraged transactions (HLTs) to the discounted value of their corresponding cash flow forecasts. For our sample of 51 HLTs completed between 1983 and 1989, the valuations of discounted cash flow forecasts are within 10 percent, on average, of the market values of the completed transactions. Our valuations perform at least as well as valuation methods using comparable companies and transactions. We also invert our analysis by estimating the risk premia implied by transaction values and forecast cash flows, and relating those risk premia to firm and industry betas, firm size, and firm book-to-market ratios.

THIS ARTICLE COMPARES THE market value of management buyouts and leveraged recapitalizations to the discounted value of their corresponding cash flow forecasts. Most economists readily accept the concept of estimating market values by calculating the discounted value of the relevant cash flows. However, little empirical evidence exists that shows that discounted cash flows provide a reliable estimate of market value. This study provides evidence of a strong relation between the market value of the highly leveraged transactions (HLTs) in our sample and the discounted value of their corresponding cash flow forecasts.

Our tests compare the transaction values in HLTs to estimates of the present value of the relevant cash flows. We use a sample of management buyouts and leveraged recapitalizations because these transactions typically release the cash flow information and transaction value required for the analysis. We use the cash flow forecasts to estimate the cash flows that will accrue to all capital providers, including different classes of debt and equity.

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We estimate a terminal value when the cash flow information ends. We value the capital cash flows and the terminal value using a discount rate based on the Capital Asset Pricing Model (CAPM). The resulting median estimates of discounted cash flows are within 10 percent of the HLT transaction values. Furthermore, the prediction errors of the discounted cash flow estimates (relative to transaction values) are qualitatively similar to those found in previous work for option pricing models (relative to call option prices).

We compare the performance of our discounted cash flow estimates to that of estimates obtained from alternative valuation approaches that rely on companies in similar industries and companies involved in similar transactions. Such alternative valuation approaches—known as comparable or multiple approaches—are commonly used in practice. The discounted cash flow (DCF) methods, individually, perform at least as well as the comparable methods. However, we also find the comparable approaches to be useful, especially when combined with a discounted cash flow valuation.

The discounted cash flow methods we use generally parallel the basic techniques taught in most business schools. Our results suggest that those techniques are both useful and reliable. We stress that our valuations rely on several ad hoc assumptions that readers (both academics and practitioners) should be able to improve on in a specific valuation. Furthermore, the discounted cash flow valuations succeed despite the additional concerns posed by HLTs beyond those associated with capital market imperfections and intertemporal asset pricing models in any valuation problem. First, the cash flow forecasts come from published legal filings and may not be constructed to be estimates of expected cash flows. Second, even if the cash flow forecasts are intended to be expected cash flows, the forecasting process is likely to involve substantial errors because major organizational changes often accompany the HLTs. Finally, since these firms have extremely leveraged capital structures, their access to capital markets and their ability to use interest tax shields may be limited. Greater attention to individual assumptions and to the HLT complications would presumably lead to better DCF valuations.

We also invert our analysis to calculate an implied discount rate—the discount rate that equates the discounted cash flow forecasts to the transaction value. The median implied market equity risk premium (7.78 percent) we obtain from this calculation is comparable to the historic arithmetic average market equity risk premium. We also examine the relation of the implied risk premia to firm size, firm book-to-market ratios, and systematic risk measures to determine if our results are consistent with Fama and French (1992), who find that firm equity returns are related to firm equity values and book-to-market ratios, but not to measures of systematic risk. We find that the implied risk premia are not significantly related to firm size or pretransaction book-to-market ratios, but are positively related to firm and industry betas. For this sample, therefore, we favor CAPM-based approaches to discount rates over those based on size or book-to-market ratios.

The success of the discounted cash flow valuation approaches in spite of the leveraged capital structures and overall complexity of the HLTs raises concerns that there is something special about our sample of HLTs. The primary concern is that the cash flows might somehow be endogenous, and that endogeneity causes the DCF valuations to be spurious estimates of transaction value. One potential source of endogeneity is that dealmakers and managers in the HLTs may have had incentives to adjust the cash flow forecasts. For example, incentives to bias the cash flow forecasts upward are present when the true expected cash flows are below the level required to obtain transaction financing. Alternatively, incentives to bias the forecasts downward are present when the true expected cash flows are substantially above those needed to obtain financing. Because the SEC and courts effectively require the board of directors of the HLT company to obtain an opinion from an investment bank that the transaction price is "fair," insiders and dealmakers may have an incentive to reduce their reported cash flow forecasts to justify the transaction price.

We conduct several tests to detect the presence of such adjustments. We examine the ex post accuracy of the cash flow forecasts and find only modest evidence of ex ante bias. We divide our sample into subsamples based on leverage and outside competition, and find little difference across the subsamples. Finally, we use our discounted cash flow valuation technique to value initial public offerings where the leverage and incentives to adjust cash flow forecasts are different from those in our HLT sample. We find that our valuations provide reliable estimates of value for the sample of initial public offerings. Overall, we find little evidence to suggest that the reliability of our discounted cash flow approaches is restricted to HLTs.

The article proceeds as follows. Section I explains our basic valuation approach in more detail. Section II describes the data set along with some sample statistics. Section III presents the valuation results and compares those results to transaction values. Section IV calculates implied risk premia and compares them to firm betas, industry betas, firm size, and firm book-to-market ratios. Section V discusses and addresses potential criticisms of our results based on the incentives to adjust cash flow forecasts. Section VI summarizes the results and presents our conclusions.

I. Valuation Techniques

A. Transaction Value

In our analyses, we compare estimates of value to the portion of actual market value that reflects future cash flows. We define the transaction value as the market value of the firm's future cash flows. The total market value of the firm equals the value of a firm's future cash flows and the firm's current excess cash. We subtract excess cash, measured as cash balances and marketable securities, from total market value to obtain our estimate of the transaction value of the firm's future cash flows. We obtain similar results when we

subtract, instead, only the excess cash used to finance the transaction. Our measure of transaction value, therefore, assumes that long-term assets and net working capital (excluding excess cash) are used to generate the cash flows of the firm. Specifically, we calculate transaction value as: 1) the market value of the firm's common stock; 2) plus the market value of the firm's preferred stock; plus 3) the value of the firm's debt; plus 4) transaction fees; less 5) the firm's cash balances and marketable securities. All of these are measured at the closing of the transaction. Debt that is not repaid as part of the transaction is valued at book value. Debt that is repaid is valued at the repayment value.

B. *The Compressed Adjusted Present Value Technique*

The Compressed Adjusted Present Value Technique (Compressed APV) that we use values firms by discounting *capital cash flows* at the discount rate for an all-equity firm.[1] Capital cash flows equal the after-corporate-tax cash flows to both debt and equity holders of the firm. Because the cash flows are measured after corporate tax, the tax benefits of deductible interest payments are included in the cash flows. The interest tax shields reduce income taxes and, thereby, raise after-corporate-tax cash flows. Our use of the Compressed APV method is equivalent to using the adjusted present value (APV) method and discounting interest tax shields at the discount rate for an all-equity firm. This assumes that the interest tax shields have the same systematic risk as the firm's underlying cash flows. An alternative way to interpret the Compressed APV method is that of discounting the capital cash flows at the before-tax discount rate that is appropriate for the riskiness of the cash flows.

The Compressed APV method simplifies the valuation of HLTs. The widely used after-tax weighted average cost of capital (WACC) approach is appreciably more difficult to implement. The WACC approach requires that the cost of capital be recomputed each period to include the effect of changing leverage over time. It also requires additional assumptions about the firm's tax status to generate cash flows assuming an all-equity capitalization.[2] The Compressed APV also has a computational advantage over the standard APV approach, because the standard APV approach requires that the all-equity cash flows and the interest tax shields be discounted separately at different discount rates.

B.1. Measuring Capital Cash Flows

We measure capital cash flows in two ways, depending on the presentation of the cash flow forecasts for the HLTs in our sample. The first method begins with net income. We add adjustments for the differences between accounting information and cash flows. These adjustments include depreciation, amortization, changes in net working capital, and interest. We also add changes in

[1] We would like to thank Stewart Myers for suggesting "Compressed APV" as a label for this method.

[2] See Ruback (1989 and 1994) for additional background on the Compressed APV technique and its relation to the weighted average cost of capital approach.

deferred taxes if the cash flow forecast provides reported or book taxes rather than actual taxes. We add (before-tax) interest payments, subtract capital expenditures, and add the after-tax proceeds from asset sales.

$$\begin{array}{l} \text{Net Income} \\ + \text{ Depreciation} \\ + \text{ Amortization} \\ - \text{ Change in net working capital} \\ + \text{ Interest (cash and noncash)} \\ - \text{ Capital expenditures} \\ + \text{ After-tax asset sales} \\ \hline = \text{Capital Cash Flows} \end{array} \qquad (1)$$

Our second method for measuring capital cash flows begins with earnings before interest and taxes (EBIT). We deduct corporate taxes that we estimate as the difference between EBIT and interest expense times the marginal tax rate. Information on the marginal corporate tax rate is provided in 33 of the HLTs in our sample. For the remaining 18, we calculate marginal corporate tax rates using the federal marginal tax rates expected to be in effect at the time of the transaction and a state tax rate of 5 percent.[3] This calculation assumes that the HLT fully uses the interest tax shields. We also adjust for differences between accounting information and cash flows, subtract capital expenditures, and add after-tax proceeds from asset sales:

$$\begin{array}{l} \text{EBIT} \\ - \text{ Corporate Tax } [= (\text{EBIT} - \text{interest}) \times \text{tax rate}] \\ + \text{ Depreciation} \\ + \text{ Amortization} \\ - \text{ Change in net working capital} \\ - \text{ Capital expenditures} \\ + \text{ After-tax asset sales} \\ \hline = \text{Capital Cash Flows} \end{array} \qquad (2)$$

In our analysis, we prefer to use the net-income-based capital cash flow measure over the EBIT-based measure. The net-income-based measure uses estimates of future tax payments made by the HLT firm, while the EBIT-based measure relies on our estimates of future tax payments. We use the EBIT-based method in the 15 HLTs in which information on projected taxes and net income is not available.

[3] For transactions completed before the Tax Reform Act of 1986 (TRA), we assume a federal tax rate of 46 percent. For transactions completed after the TRA, we assume federal tax rates of 46 percent in 1986, 38 percent in 1987, and 34 percent thereafter.

B.2. Terminal Values

We obtain terminal values by calculating a terminal capital cash flow and assuming that terminal capital cash flow will grow at a constant nominal rate in perpetuity.

The calculation of the terminal capital cash flow begins with the capital cash flow in the last forecast year and adjusts for the difference between capital expenditures and depreciation and amortization. Assuming a growing perpetuity, capital expenditures should be at least as large as depreciation and amortization. On average, however, depreciation and amortization exceed capital expenditures in the last forecast year for our sample of HLTs. In practice, armed with more information about depreciation schedules, it would be possible to adjust for this inconsistency by forecasting steady-state depreciation. In our analysis, we (partially) eliminate the inconsistency by setting depreciation and amortization equal to capital expenditures in the capital cash flow in the last forecast year. We call this adjusted cash flow the terminal capital cash flow.[4]

The growth in the nominal terminal capital cash flow should reflect both expected inflation growth and real growth. Unfortunately, only 11 of 51 sample transactions explicitly note an expected inflation rate. The average expected inflation rate is 5 percent. Actual inflation (as measured by growth of the GNP deflator) averaged 3.4 percent per year between 1983 and 1989. In 1988, the year almost 50 percent of our transactions were priced, the GNP deflator increased by 3.3 percent. We present our results using a nominal growth rate of 4 percent, which corresponds to a real growth rate between 0 percent and 1 percent. We also report the sensitivity of our results to different terminal cash flow growth rates.

B.3. Discount Rates

We discount the capital cash flows using the expected return implied by the Capital Asset Pricing Model for the unlevered firm:

$$r^u = r_f + \beta^u \times [r_m - r_f] \tag{3}$$

where r_f is the risk free rate, β^u is the firm's unlevered beta or systematic risk, and $r_m - r_f$ is the risk premium required by investors to invest in a firm or project with the same level of systematic risk as the stock market.

We use the unlevered (or all-equity) cost of capital because it is a reasonable estimate of the riskiness of the firm's assets. Our cash flow measure includes all of the cash flows generated by the assets, including interest tax shields. Under the assumption that the riskiness of these cash flows is the same as that of the firm's assets, the unlevered cost of capital is the appropriate discount rate using the Capital Asset Pricing Model. This method is equivalent to using

[4] We obtain qualitatively similar results when we repeat the analyses with no adjustment, and with capital expenditures set equal to depreciation and amortization.

the Adjusted Present Value method (see Brealey and Myers (1991)) and discounting the forecast interest tax shields at the unlevered cost of capital.[5]

The unlevered cost of capital also can be interpreted as the before-corporate-tax, weighted average cost of capital. The before-tax discount rate is appropriate to discount capital cash flows because the tax benefits of interest are included in our cash flow measure. By adjusting the cash flows for taxes and applying Modigliani and Miller (1963), the weighted average cost of capital is the same for different levels of leverage and we do not have to estimate the cost of debt.

We present valuations using three different measures of systematic risk. First, we use a *firm-based* measure. We estimate equity β's, β^e, using daily stock returns, returns on the S&P 500, and a Dimson (1979) correction. Returns are used from 540 to 60 days before the transaction is announced. To obtain β^u, we unlever β^e:

$$\beta^u = [\beta^e \times E + \beta^p \times P + \beta^d \times D \times (1 - \tau)]/[E + P + D \times (1 - \tau)] \quad (4)$$

where E equals the market value of firm equity 60 days before the transactions is announced, P equals the (book) liquidation value of non-convertible preferred stock, and D equals net debt—the book value of short-term and long-term debt, less cash and marketable securities at the time of the transaction. We assume the systematic risk of the preferred stock and the debt, β^p and β^d, with respect to returns on the S&P 500 equal 0.25—the beta reported for high grade debt from 1977 to 1989 in Cornell and Green (1991).[6] Finally, the tax rate, τ, equals the combined marginal federal and state tax rate during the estimation period. Consistent with the low pre-HLT debt levels of the sample firms, this β^U calculation assumes that the pre-HLT tax shield has the same risk characteristics as pre-HLT debt.

Second, we use an *industry-based* measure of systematic risk. We calculate industry equity betas using daily returns from a value-weighted portfolio of all New York and American Stock Exchange companies in the same two-digit SIC code as the sample companies. The industry equity betas are calculated from 540 to 60 days before the transaction is announced using returns on the S&P 500, and a Dimson (1979) correction. We use equation (4) to unlever the industry equity betas with the value-weighted ratios of equity, preferred, and debt to total capital for firms in the relevant industry. These industry ratios

[5] This analysis values interest tax shields at the full corporate tax rate, but assumes that the ability to use the tax shields has the same systematic risk as the (cash flows of the) unlevered or all-equity firm. These simplifying assumptions have two offsetting effects on our estimated values. First, the expected values of the interest tax shields in reality are less than those implied by the corporate tax rate because there is a nontrivial probability that a given HLT firm will suffer losses and be forced to carry forward some interest tax shields. Accounting for this would lower our estimated values. On the other hand, the ability to use the interest tax shields has less systematic risk than the unlevered firm because the expected value of the tax shields does not increase once the firm is fully taxable. Accounting for this would raise our estimated values.

[6] Only 7 of the sample companies have any such preferred outstanding.

are calculated using COMPUSTAT data for the fiscal year ending before the HLT is announced.

Third, we use a *market-based* measure of systematic risk that assumes that the systematic risk for all sample firms equals the risk of the assets of the market. To obtain the market asset beta, we calculate the leverage of nonfinancial and nonutility firms in the S&P 500. The median leverage ratio during the sample period, 1983 to 1989, was 0.20. Combining the market leverage in the year before the transaction, a debt beta of 0.25, and adjusting for taxes using equation (4), the median unlevered asset beta for the market equals 0.91.

We calculate the risk premium as the arithmetic average return spread between the S&P 500 and long-term Treasury bonds from 1926 until the year before the transaction is announced. For our sample firms, the median risk premium is 7.42 percent. In using this risk premium, we are following the general recommendation in finance texts to use the arithmetic average historical risk premium. (For example, see Brealey and Myers (1991)). The historical arithmetic average risk premium approach implicitly assumes 1) that returns are independent; and 2) that the underlying probability distribution is stable. There is some disagreement about the appropriateness of the arithmetic average measure of risk premia. Some are concerned that evidence of autocorrelation in returns suggests that returns are not independent. Others are concerned about the stability of the distribution; Blanchard (1993), for example, argues that the equity risk premium declined to 3 percent or 4 percent by the end of the 1980s. The reasonableness of our choice is an empirical question that we implicitly test in Section III and explicitly consider in Section IV.

Finally, we use the long-term (approximately 20 years to maturity) Treasury bond yield to measure the risk-free rate in our cost of capital calculations. Long-term Treasury bond yields, by month, are obtained from Ibbotson Associates (1991). Our specifications implicitly assume a long-term investment horizon. However, we obtain qualitatively similar results when we base our analyses on a short-term investment horizon. For a short-term horizon, we estimate the risk-free rate as the long-term Treasury bond yield less the historic arithmetic average spread between Treasury bond and Treasury bill returns, and we use a risk premium equal to the long-term arithmetic average return spread between the S&P 500 and Treasury bills.

C. Valuation Methods Using Comparables

Practitioners often value companies using trading or transaction multiples. In these methods, a ratio or multiple of value relative to a performance measure is calculated for a set of guideline or comparable firms. Earnings before interest, taxes, depreciation, and amortization (EBITDA) and earnings before interest and taxes (EBIT), net income, and revenue are commonly used performance measures. Value is estimated by multiplying the ratio or multiple from the guideline companies by the performance measure for the company being valued.

Valuation by comparables or multiples relies on two assumptions. First, the comparable companies have future cash flow expectations proportional to and risks similar to those of the firm being valued. Second, the performance measure (like EBITDA) is actually proportional to value. If these assumptions are valid, the comparable method will provide a more accurate measure of value than any discounted cash flow approach because it incorporates contemporaneous market expectations of future cash flows and discount rates in the multiple. In practice, however, the comparable companies are not perfect matches in the sense that cash flows are not proportional and risks are not similar. Also, there is no obvious method to determine which measure of performance—EBITDA, EBIT, net income, revenue, and so on—is the most appropriate for comparison. Consistent with these concerns, Kim and Ritter (1994) find that comparable methods are not particularly successful in pricing initial public offerings.

The discounted cash flow method relies on forecast cash flows that directly relate to the firm being valued and discount rates which are based on the historical riskiness of the firm or its industry. The reliability of the discounted cash flow valuation depends on the accuracy of the cash flow projections, risk measures, and the assumptions used in calculating the cost of capital, including the historical measure of the risk premium. Both the discounted cash flow methods and the comparable firm methods therefore have inherent estimation errors. The empirical issue is whether the benefits of using firm-specific information in the discounted cash flow method are greater than the costs of ignoring the contemporaneous measures of market expectations contained in the comparable methods.

To make the values estimated with multiples comparable to those estimated using capital cash flows, we base our multiples on EBITDA. We use three different measures of guideline or comparable companies. The first, which we label *comparable company*, uses a multiple calculated from the trading values of firms in the same industry as the firm being valued. The second, which we label *comparable transaction*, uses a multiple from companies that were involved in a similar transaction to the company being valued. The third, which we label *comparable industry transaction*, uses a multiple from companies in the same industry that were involved in a similar transaction to the company being valued.

We construct comparable company value as the sample firm's EBITDA in the year before the transaction multiplied by the median industry multiple of total capital value in the month of the transaction to EBITDA in the year before the transaction. Total capital value is the analog of transaction value, equalling the sum of the market value of common stock, the liquidation value of firm preferred stock, and the book value of firm short- and long-term debt, less the cash balances and marketable securities of the firm. To get as close a match as possible, we calculate the industry multiples using companies (on COMPUSTAT) with the same four-digit Standard Industrial Classification (SIC) code and with total capitalizations of at least $40 million. If there are

fewer than five comparable companies at the four-digit level, we match companies at the three-digit level, and, if necessary, at the two-digit level.

We calculate comparable transaction value as the sample firm's EBITDA in the year before the transaction times the median ratio of total transaction value to EBITDA (in the year before the transaction) for comparable HLTs. Comparable HLTs are those HLTs among the 136 in Kaplan and Stein (1990 and 1993) that are priced within one year of the date the sample transaction is priced.

Comparable industry transaction values combine the comparable company and comparable transaction approaches by estimating comparable transaction values for HLTs in the same industry. We use the sample firm's EBITDA in the year before the transaction times the median multiple of total transaction value to EBITDA in the year before the transaction for HLTs in the same 2-digit SIC code that are priced within two years of the date the sample transaction is priced. We are unable to obtain an acceptable comparable industry HLT for more than one-quarter of the HLTs (13 of 51), and, therefore, the sample size for this measure is lower. Because the sample from which we draw the comparables includes a large fraction of the HLT universe, we do not believe this is a sample-specific problem.

II. Data

Our sample of companies starts with two sources of highly leveraged transactions. First, we use the sample of 124 management buyouts (MBOs) analyzed by Kaplan and Stein (1993). These buyouts satisfy four conditions: 1) the companies are originally publicly owned; 2) the transaction is completed between 1980 and 1989; 3) at least one member of the incumbent management team obtains an equity interest in the new private firm; and 4) the total transaction value exceeds $100 million.

We add to this the sample of 12 leveraged recapitalizations examined by Kaplan and Stein (1990). A leveraged recapitalization is similar to a MBO in many respects except that it does not involve the repurchase of all of a company's stock. While there is a dramatic increase in leverage, public stockholders retain some interest in the company. These leveraged recapitalizations were completed between 1985 and 1989.

We examined the documents describing the transactions that these firms filed with the SEC. These documents include proxy statements, Schedule 14D tender offer filings, and Schedule 13E-3 filings. Rule 13E-3 applies to transactions in which insiders potentially stand to benefit at the expense of outside, public shareholders. Item 8 of Rule 13E-3 requires the HLT's board of directors to indicate whether the transaction is fair (or unfair) to public shareholders, and to provide a detailed discussion of the basis for that opinion. Item 9 further requires the HLT board to furnish a summary of any report from an outside party that relates to the opinion in Item 8. The disclosure in Item 9 usually includes cash flow forecasts. Accordingly, all but 12 of the 136 companies provide some post-transaction financial projections or forecasts.

Table I

Sample Highly Leveraged Transactions

Highly leveraged transactions (HLTs) with usable projections by year of transaction, by type of transaction, and by whether the projections reflect the transaction for 136 management buyouts (MBOs) and HLTs completed between 1980 and 1989.

	All Transactions		MBOs		Recapitalizations	
Year	Total	Reflect Transaction	Total	Reflect MBO	Total	Reflect Recap
1983	1	0	1	0	0	0
1984	2	0	2	0	0	0
1985	3	3	2	2	1	1
1986	8	8	4	4	4	4
1987	6	3	5	2	1	1
1988	24	14	22	12	2	2
1989	7	5	7	5	0	0
Total	51	33	43	25	8	8

Unfortunately, the forecasts do not always include enough information to do a complete valuation. We include in our sample those companies that provide at least four years of post-transaction projections for 1) operating income before interest, depreciation, amortization, and taxes; 2) depreciation and amortization; 3) capital expenditures; and 4) changes in net working capital. These cash flows are the minimum required to calculate the capital cash flows. In two additional cases, commercial bankers provided us with projections distributed by buyout promoters at the time of the transaction that were not available in SEC documents. We obtained the required information for 51 of the 136 HLTs. Twenty-two of these companies provide ten years of cash flow projections; three, nine years; three, eight years; one, seven years; seven, six years; fourteen, five years; and one, four years.

Table I shows the number of transactions with complete projections by year of the transaction. This sample is time-clustered. Almost one-half of the transactions were completed in 1988. All but six of the transactions were completed between 1986 and 1989. Table I also distinguishes between MBOs and recapitalizations: forty-three transactions are MBOs while eight are recapitalizations.

Finally, Table I reports that in thirty-three transactions, the financial projections explicitly state that they reflect the buyout or recapitalization. The remaining eighteen state that the projections do not reflect the transaction. Unfortunately, the meaning of this statement is not always clear. Not reflecting the transaction may simply mean that the projections do not reflect the proposed capital structure. Alternatively, the projections may not reflect expected operating changes. The different classification does not seem to matter much because the compressed APV estimates for the 33 forecasts that reflect the transactions generally yield similar results to those for the 18 forecasts that are ambiguous. We note when they differ.

For each transaction with complete projections, we obtain information describing the transactions from proxy, 13E-3, or 14D statements. Stock prices two months before the transaction announcement and at transaction completion are obtained from the Center for Research in Security Prices (CRSP) database and Standard & Poor's *Daily Stock Price Record*. Other financial data are obtained from the COMPUSTAT Tapes. For more details on these transactions, see Kaplan and Stein (1990 and 1993).

In Section V, we address possible endogeneity issues by performing similar analyses for cash flow forecasts of a smaller sample of eight initial public offerings (IPOs) completed between October 1991 and July 1992. The IPO firms are firms that had previously gone private in leveraged buyouts. Because the IPOs involved refinancing existing loans, the IPO firms provided cash flow forecasts to commercial bankers who held the loans, and we obtained the forecasts from those bankers. These cash flow forecasts are not available in SEC documents and, therefore, were not available to public shareholders.

III. Valuation Results

A. Compressed APV Methods

Panel A of Table II presents summary statistics for the valuation or estimation errors of the three discounted cash flow and three comparable valuation methods. The errors are computed as the log of the ratio of our estimated values to the transaction value. We use the log ratio because it is symmetric with respect to overestimates and underestimates. We present the errors in percent so that they can be interpreted as the percentage differences between the estimated value and the transaction value.

Focusing on the Compressed APV estimates using firm-specific betas, Panel A reports that the median error is 6.0 percent, which means that the DCF estimate is 6.0 percent greater than the transaction value. Across the Compressed APV measures, the median errors are 6.2 percent for the industry-based estimates, and 2.5 percent for the market-based estimates. The median errors for the market-based estimates are not significantly different from zero. The mean errors are similar with the estimates based on firm-based betas overestimating transaction values the most, industry-based beta estimates exhibiting less of an overestimate of value, and the market-based beta estimates being closest to transaction value. The variation in the valuation errors is also greatest for the firm-based beta estimates.

Panel B of Table III presents median estimation errors for different equity risk premia. The results indicate that recommendations to use lower risk premia would reduce the accuracy of the discounted cash flow estimates of value. For example, if we use a risk premium of 6 percent, the median errors increase to 16.4 percent for the firm-based beta estimates, to 17.7 percent for the industry-based estimates, and to 13.6 percent for the market-based estimates. In contrast, when a higher risk premium is used, such as 9 percent, the median errors of the firm-based, industry-based, and market-based er-

Table II

Comparison of Different Valuation Methods

Comparison of Capital Asset Pricing Model (CAPM)-based and comparable-based valuation methods in 51 highly leveraged transactions completed between 1983 and 1989. The first four rows present the medians, means, standard deviations, and interquartile ranges of the valuation errors. The valuation errors equal the natural log of estimated values relative to transaction values. Valuation errors are reported in percent. Performance measure 1 is the percentage of transactions in which absolute value of the valuation errors is less than or equal to 15 percent. Performance measure 2 is the mean absolute error of the valuation errors (in percent). Performance measure 3 is the mean squared error of valuation errors (in percent). CAPM-based values are the estimated present values of projected capital cash flows. Terminal values are grown at 4 percent. Discount rates equal the long-term Treasury bond yield at the time of the projections plus the equity risk premium times the relevant asset beta. The risk premium is the arithmetic average premium of the S&P 500 return over the long-term Treasury bond return from 1926 until the year before the transaction is announced. Estimated present values are calculated using (A) CAPM-based approach with firm asset betas; (B) CAPM-based approach with industry asset betas from value-weighted industry portfolios; (C) CAPM-based approach with market asset betas. Comparable values are calculated using (D) comparable company approach; (E) comparable transaction approach; and (F) comparable industry transaction approach (for which observations are limited to 38 transactions). The transaction value equals (1) market value of the firm common stock; plus (2) market value of firm preferred stock; plus (3) value of firm debt; plus (4) transaction fees; less (5) firm cash balances and marketable securities, all at the time of the transaction. Debt not repaid in the transaction is valued at book value; debt that is repaid, at the repayment value.

	CAPM-Based Valuation Methods			Comparable Valuation Methods		
	(A) Firm Beta	(B) Industry Beta	(C) Market Beta	(D) Comparable Company	(E) Comparable Transaction	(F) Comparable Industry Transaction ($N = 38$)
Panel A: Summary Statistics for Valuation Errors						
1. Median	6.0%	6.2%	2.5%	−18.1%	5.9%	−0.1%
2. Mean	8.0%	7.1%	3.1%	−16.6%	0.3%	−0.7%
3. Standard deviation	28.1%	25.1%	22.6%	25.4%	22.3%	28.7%
4. Interquartile range	31.3%	23.0%	27.3%	41.9%	32.2%	23.7%
5. Asset beta (median)	0.81	0.84	0.91			
Panel B: Performance Measures for Valuation Errors						
1. Percentage within 15%	47.1%	62.7%	58.8%	37.3%	47.1%	57.9%
2. Mean absolute error	21.1%	18.1%	16.7%	24.7%	18.1%	20.5%
3. Mean squared error	8.4%	6.7%	5.1%	9.1%	4.9%	8.0%

Table III

Sensitivity of CAPM-Based Approaches to Equity Risk Premium, Terminal Value Growth Rate, and Reflecting Transaction

Sensitivity of Capital Asset Pricing Model (CAPM)-based valuation methods to equity risk premium, terminal value growth rate assumptions, and whether the projections explicitly reflect the transaction in 51 highly leveraged transactions (HLTs) completed between 1983 and 1989. Median is the median of the valuation errors (in percent). The valuation errors equal the natural log of estimated values relative to transaction values. Mean absolute error is the mean absolute error of the valuation errors. CAPM-based values are the estimated present values of projected capital cash flows. Discount rates equal the long-term Treasury bond yield at the time of the projections plus the equity risk premium times the relevant asset beta. In the base case in Panel A, terminal values are grown at 4 percent and the equity risk premium is the arithmetic average premium of the S&P 500 return over the long-term Treasury bond return from 1926 until the year before the transaction is announced. The median risk premium in the base case is 7.42 percent. In Panel B, values are estimated using equity risk premiums of 5, 6, and 9 percent. In Panel C, values are estimated using terminal value growth rates of 0, 2, 6, and 8 percent. Estimated present values are calculated using (A) CAPM-based approach with firm asset betas; (B) CAPM-based approach with industry asset betas from value-weighted industry portfolios; (C) CAPM-based approach with market asset betas. Transaction value equals (1) market value of the firm common stock; plus (2) market value of firm preferred stock; plus (3) value of firm debt; plus (4) transaction fees; less (5) firm cash balances and marketable securities, all at the time of the transaction. Debt not repaid in the transaction is valued at book value; debt that is repaid, at the repayment value.

		Valuation Errors for CAPM-Based Valuation Methods					
		Median			Mean Absolute Error		
Terminal Value Growth Rate	Equity Risk Premium (Median)	(A) Firm Beta	(B) Industry Beta	(C) Market Beta	(A) Firm Beta	(B) Industry Beta	(C) Market Beta
Panel A: Base Case							
4%	7.42%	6.0%	6.2%	2.5%	21.1%	18.1%	16.7%
Panel B: Vary Equity Premium							
4%	5%	25.0%	24.8%	21.2%	30.1%	29.2%	26.6%
4%	6%	16.4%	17.7%	13.6%	25.2%	23.0%	20.3%
4%	9%	−2.3%	−3.1%	−7.6%	20.3%	17.0%	17.4%
Panel C: Vary Terminal Value Growth Rate							
0%	7.42%	−7.0%	−8.6%	−10.7%	18.3%	17.1%	17.8%
2%	7.42%	−1.2%	−2.4%	−4.8%	18.2%	16.1%	16.5%
6%	7.42%	18.6%	18.0%	12.7%	27.9%	23.7%	20.6%
8%	7.42%	32.9%	30.9%	26.3%	39.5%	34.8%	29.7%
Panel D: 33 HLTs in Which Projections Explicitly Reflect Transactions							
4%	7.42%	6.4%	10.3%	6.1%	20.7%	17.9%	14.9%

rors decline, with errors of −2.3 percent, −3.1 percent, and −7.6 percent, respectively.

We also experimented with beta estimation techniques that adjust for the tendency of betas to regress to the mean in future periods.[7] These adjustments included using 1) equity betas that equal an equal-weighted average of the firm or industry beta and the market beta, i.e., estimates that push the firm or industry equity betas toward one; 2) the Bayesian approach in Vasicek (1973) that estimates equity betas as a weighted average of firm equity betas and the sample mean using the historical distribution of the sample beta coefficients; and 3) the Bayesian approach in Stevens (1993) that estimates equity betas using information in firm and industry equity betas. These methods are basically weighted averages of those presented in Table II, and the results using these different techniques are roughly combinations of those reported in Table II.

Panel C of Table III reports median estimation errors for different assumptions about terminal value growth. Values increase as the terminal value growth rate increases. At no growth, median errors for the Compressed APV methods vary from −7.0 percent to −10.7 percent. At 2 percent growth, the Compressed APV methods are close to zero, especially for the firm-based beta estimates. For growth rates above 4 percent, the median errors for all of the Compressed APV methods are substantially greater than zero. Overall, these results suggest that our selection of 4 percent for the growth rate for terminal cash flows is reasonable.

The ordering of the accuracy of the Compressed APV measures based on medians depends on the assumptions and the sample selection. Panels B and C of Table III indicate that assumptions about risk premia and growth rates shift the distribution of value estimates. And Panel D of Table III shows that the median errors for the industry-based and market-based beta estimates both rise relative to the firm-based beta estimates for the subsample of 33 observations that explicitly reflect the transactions. The results for the medians, therefore, suggest that the Compressed APV methods are reliable and useful measures of value, but do not provide enough basis to discriminate among the Compressed APV methods.

B. Comparable Methods

Panel A of Table II also reports the valuation errors when value is estimated using the three comparable methods. The estimates based on the comparable company method substantially underestimate transaction value, with a median estimation error of −18.1 percent. This is well outside the range of median errors for the Compressed APV methods.

The comparable transaction based estimates are more accurate, with a median error of 5.9 percent, which is in the range of median errors for the Compressed APV estimates. In fact, the mean valuation error of 0.3 percent for

[7] See Blume (1975) and Klemkosky and Martin (1975).

the comparable transactions is closer to zero than the mean valuation errors for the Compressed APV estimates.

The most accurate estimates are those for the comparable industry transaction method with median and mean valuation errors of −0.1 percent and −0.7 percent. This method has the highest standard deviation, however, suggesting that the accuracy varies across firms in the sample. This highlights the fact that the method is not generally applicable because it is difficult to match both the industry and the transaction. We were unable to find matches for 13 of the 51 firms in our sample during a period in which there were a relatively large number of HLTs. In other samples and time periods, we suspect this problem would be even worse. This method also is difficult to generalize to other common valuation problems, such as capital investment decisions, because there is typically no transaction to match.

We also examined (but do not report in the tables) hybrid approaches in which we estimate the terminal value as the product of the (current) comparable company EBITDA multiple and the EBITDA forecast in the last year of the projections. These approaches are commonly used by investment bankers. We then discount the capital cash flows and terminal value at the discount rate for one of the three APV approaches. We performed this analysis using all years of projected cash flows as well as using only two, three, or four years of projected cash flows. In the median HLT for all of these approaches, the estimated values exceed transaction values by more than 10 percent. For example, using a market-based discount rate and all years of projections, we find that the median estimated value exceeds the transaction value by 18.7 percent.

The likely explanation for the poor performance of the hybrid approaches is that the EBITDA multiple at the time of the transaction includes a weighted average of higher growth during the forecast period and lower growth after the forecast period. By using the cash flows forecast over the forecast period and then applying the current EBITDA multiple at the end of the period, the

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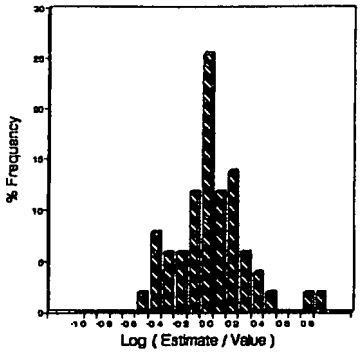
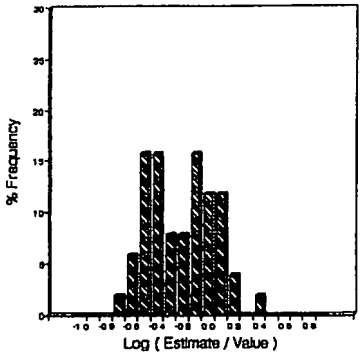
Figure 1. Distribution of valuation errors. Distribution of valuation errors for CAPM-based and comparable-based valuation methods in 51 highly leveraged transactions completed between 1983 and 1989. The valuation errors equal the natural log of estimated values relative to transaction values. CAPM-based values are the estimated present values of projected capital cash flows. Terminal values are grown at 4 percent. Discount rates equal the long-term Treasury bond yield at the time of the projections plus the equity risk premium times the relevant asset beta. The risk premium is the arithmetic average premium of the S&P 500 return over the long-term Treasury bond return from 1926 until the year before the transaction is announced. Estimated present values are calculated using (A) CAPM-based approach with firm asset betas; (B) CAPM-based approach with industry asset betas from value-weighted industry portfolios; (C) CAPM-based approach with market asset betas. Comparable values are calculated using (D) comparable company approach; (E) comparable transaction approach; and (F) comparable industry transaction approach (for which observations are limited to 38 transactions). The transaction value equals (1) market value of the firm common stock; plus (2) market value of firm preferred stock; plus (3) value of firm debt; plus (4) transaction fees; less (5) firm cash balances and marketable securities, all at the time of the transaction. Debt not repaid in the transaction is valued at book value; debt that is repaid, at the repayment value.

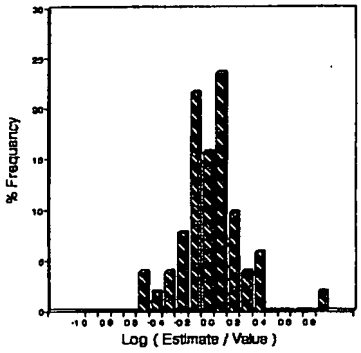
CAPM with Firm Beta



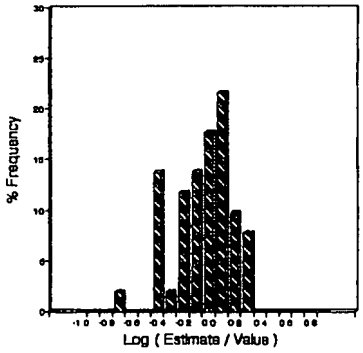
Comparable Company Method



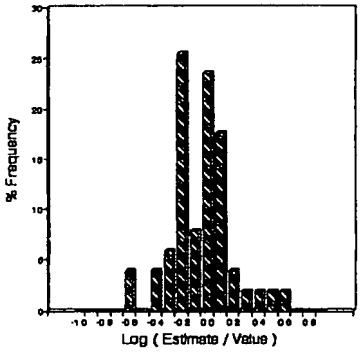
CAPM with Industry Beta



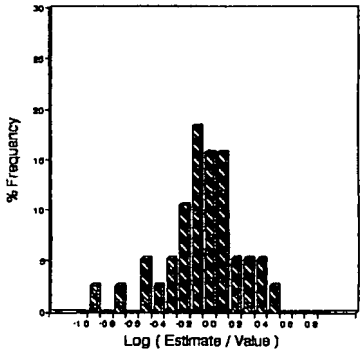
Comparable Transaction Method



CAPM with Market Beta



Comparable Industry Transaction Method



hybrid approach effectively double-counts the higher growth during the forecast period.

C. Comparative Performance of Valuation Methods

The previous results suggest that both the Compressed APV and the comparable valuation methods are useful in estimating transaction values. In this section, we compare the Compressed APV and comparable valuation methods in greater detail, using several measures of central tendency.

To be useful and reliable, the estimates of value should exhibit a central tendency towards the transaction value. For two measures with the same median or mean, the measure with the greater central tendency is preferred. To examine the degree of central tendency across the Compressed APV and comparable methods, we present histograms of the errors for each measure in Figure 1, and the percentage of errors within 15 percent, mean absolute errors (MAEs), and mean squared errors (MSEs) in Panel B of Table II.

Figure 1 suggests that the Compressed APV methods exhibit more central tendency than the comparable methods. The Compressed APV histograms show that the distribution of errors is symmetric with a clear central tendency. The firm-based and industry-based beta methods, however, have two and one large outlier, respectively. These outliers are transactions that combine low betas with relatively high cash flow forecasts. In contrast, the comparable methods show less of a central tendency and appear to have flatter, more uniform distributions.

The numerical measures of central tendency confirm the impression from the histograms. Panel B.1 of Table II reports the percentage of transactions in which the absolute value of the valuation error is less than or equal to 15 percent. The cutoff of 15 percent is, of course, arbitrary. But it does provide a measure of central tendency, and using other cutoffs such as 10 percent or 20 percent does not change the qualitative results. The estimates using the firm-based Compressed APV method are within 15 percent of transaction value for almost one-half of the sample. The industry-based and the market-based estimates do better, with approximately 60 percent of the estimates within 15 percent of transaction value.

The comparable company method is the least successful method, with only 37 percent of observations within 15 percent. The percentages for the industry-based and market-based APV methods are significantly greater (at the 10 percent level or better) than those for the comparable company method. The comparable transaction method is more successful than the comparable company method, but generally less successful than the Compressed APV methods. In the 38 transactions for which we can apply the comparable industry transaction approach, 58 percent of the valuation errors are less than 15 percent, roughly the same percentage as for the Compressed APV methods.

We also examine two performance measures that make assumptions about the cost of estimation errors: the mean absolute error and the mean squared error of the valuation errors. Both measures assume that under- and over-

valuations are equally costly. The MAE assumes that the cost of valuation errors increases linearly, while the MSE assumes that the cost increases are quadratic. Both measures are reported in panel B of Table II, and both give qualitatively similar results. The MAE is 21.1 percent for the Compressed APV estimates using firm-based betas, 18.1 percent using industry-based betas, and 16.7 percent using market-based betas. The comparable methods have generally higher MAEs: 24.7 percent for the comparable company method; 18.1 percent for the comparable transaction method; and 20.5 percent for the comparable industry transaction method. The MAEs of the industry- and market-based APV methods are significantly smaller than the MAE of the comparable company method.

Finally, some readers might find it difficult to interpret these results in isolation. Accordingly, we compare the results for the Compressed APV method to those obtained in other financial applications. The obvious comparison is to models of option pricing. Whaley (1982) performs an analysis similar in spirit to ours for pricing American call options on dividend-paying stocks using variants of the Black-Scholes option pricing model. He finds mean prediction errors of 1.1 percent to 2.2 percent with standard deviations of 23.8 percent to 25.2 percent. These are qualitatively similar to those found for the Compressed APV methods, particularly the market-based method. In more recent work, Amin and Morton (1994) use six different models to price options on Eurodollar futures. Those models yield MAEs ranging from 15.2 percent to 21.1 percent which are, again, qualitatively similar to those obtained using the Compressed APV methods.

We conclude, based on the results presented in Tables II and III, that the Compressed APV techniques provide a reasonable and accurate measure of value. The median errors are below 6.2 percent for all Compressed APV methods; the valuation errors have a strong tendency towards zero; and the valuation errors are qualitatively similar to those for option pricing models. The industry-based and market-based methods consistently perform better than the firm-based methods. The Compressed APV estimates using these two approaches perform about equally well.

Among the comparable methods, the comparable company method performs poorly. It is the least reliable valuation method we examine across all of the performance measures. The comparable transaction and the comparable industry transaction methods both do better than the comparable company method, and work almost as well as the Compressed APV methods.

We favor the Compressed APV methods over the comparable methods for three reasons. First, the Compressed APV methods tend to have more valuation errors within 15 percent, and have lower MAEs and MSEs. Second, the comparable methods that work best are based on transactions, and therefore have little applicability beyond a transaction context. In contrast, the Compressed APV method can be used in a variety of corporate finance applications. This criticism is relevant even in the current sample for the comparable industry transaction method because that method fails to produce estimated values for more than one-quarter of the sample HLTs. Third, we think that, in

practice, participants are likely to have access to better estimates of cash flows and other inputs into the Compressed APV method than we have had available to us. On the other hand, we think that our information on comparables—especially on comparable transactions—is close to the information that would have been used in practice. There are potential improvements in the application of comparables, especially by making industry-specific choices of the type of multiple to apply. Nevertheless, we think the practical application of the Compressed APV method will improve its accuracy more than it will improve the comparable approaches.

D. Cross-Sectional Relation of Estimated Values to Transaction Values

The results in the previous sections focus on how well the Compressed APV and comparable valuation approaches estimate the actual transaction value level. It is possible, however, that one of the approaches could successfully estimate the transaction value on average, yet perform poorly in explaining the variation in transaction values. The converse is also possible. In this section, we consider these possibilities by estimating regressions to determine how well the different valuation methods explain the variation in transaction values. With a regression approach, we can also test whether using the DCF and comparable approaches together can explain additional variation.

The regressions relate transaction values to estimated values from the Compressed APV and comparable methods. The basic model we want to estimate is:

$$\text{Transaction Value} = \alpha + \beta \text{ Estimated Value} + \varepsilon \qquad (5)$$

If the estimated values are unbiased predictors of transaction value, the coefficient estimates for the intercept will be zero and for the slope, will be one. Because it seems likely that the intercept term and the error term will be related to value or size, we consider two specifications of the model. First, we regress the log of transaction value on the log of estimated value. Second, we eliminate size entirely by regressing the transaction value as a multiple of EBITDA on estimated value, again expressed as a multiple of EBITDA.

Column 1 of Table IV presents the regression results for the log-log specification. The estimates from the three Compressed APV approaches in Column 1 are consistent with the approach providing unbiased estimates of transaction values. The intercepts are all insignificantly different from zero, and the slopes are all insignificantly different from one. The F-statistics of the joint test (intercept equal to zero and slope equal to one) are insignificant for all three methods. Furthermore, the estimated values explain virtually all the variation in transaction values and the residuals from the log-log specification are well-behaved—there is no evidence of heteroscedasticity or undue influence from large observations.

Table IV

Cross-Sectional Relation of Estimated Values to Transaction Values

Regressions of transaction values on estimated net present values in 51 highly leveraged transactions completed between 1983 and 1989. Regressions using multiples include transaction values and estimated net present values as multiples of EBITDA (earnings before interest, taxes, depreciation, and amortization) in the year before the transaction. Estimated net present values are calculated using (A) Capital Asset Pricing Model (CAPM)-based approach with firm asset betas; (B) CAPM-based approach with industry asset betas from value-weighted industry portfolios; (C) CAPM-based approach with market asset betas; (D) comparable company approach; and (E) comparable transaction approach. All CAPM-based approaches use a terminal value growth rate of 4 percent. Transaction value equals (1) the market value of the firm common stock; plus (2) the market value of firm preferred stock; plus (3) the value of the firm debt; plus (4) transaction fees; less (5) firm cash balances and marketable securities, all at the time of the transaction. Debt not repaid in the transaction is valued at book value; debt that is repaid, at the repayment value. Standard errors are in parentheses. Dependent variable is transaction value or transaction value as a multiple of prior year EBITDA.

	Regressions of Logs				Regressions of Levels	
Estimated Values	1. Univariate Regressions (Logs)	2. Combined Regression (Logs)	3. Univariate Regressions (Multiples)	4. Combined Regression (Multiples)	5. Univariate Regression (Multiples)	6. Combined Regressions (Multiples)
Panel A: Firm Beta						
Constant	0.06 (0.21)		1.25* (0.18)		5.50* (0.80)	
Slope	0.98* (0.03)		0.39* (0.08)		0.32* (0.08)	
	R^2 = 0.95		R^2 = 0.33		R^2 = 0.24	
Panel B: Industry Beta						
Constant	0.05 (0.19)		1.10* (0.17)		4.85* (0.73)	
Slope	0.98* (0.03)		0.46* (0.08)		0.39* (0.07)	
	R^2 = 0.96		R^2 = 0.43		R^2 = 0.36	
Panel C: Market Beta						
Constant	0.22 (0.17)	0.21 (0.13)	1.06* (0.19)	−0.16 (0.66)	3.82* (0.88)	−1.46 (2.69)
Slope	0.97* (0.03)	0.35* (0.10)	0.50* (0.09)	0.36* (0.10)	0.55* (0.10)	0.34* (0.11)
	R^2 = 0.97		R^2 = 0.39		R^2 = 0.39	
Panel D: Comp. Company						
Constant	0.55* (0.17)		1.28* (0.23)		4.51* (0.82)	
Slope	0.94* (0.03)	0.28* (0.09)	0.43* (0.12)	0.29* (0.11)	0.55* (0.11)	0.40* (0.11)
	R^2 = 0.96		R^2 = 0.22		R^2 = 0.34	
Panel E: Comp. Transaction						
Constant	0.21 (0.16)		0.39 (0.77)		1.40 (3.49)	
Slope	0.97* (0.02)	0.35* (0.11)	0.82** (0.36)	0.46 (0.31)	0.85** (0.42)	0.50 (0.33)
	R^2 = 0.97	R^2 = 0.98	R^2 = 0.09	R^2 = 0.48	R^2 = 0.08	R^2 = 0.53
No. of observations	51	51	51	51	51	51

* and ** denote significant difference from zero at the 1 and 5 percent level, respectively.

Again, the Compressed APV methods perform at least as well as the comparable methods. The comparable value methods explain a similar amount of variation in transaction value. However, in the comparable company regression, the intercept is different from zero and the slope coefficient is different from one. The joint F-test of an intercept of zero and slope of one is strongly rejected.[8]

In some sense, however, the DCF and comparable approaches are too successful in explaining the variation in transaction values using the log-log specification. Although the residuals in the regressions are well-behaved, the log-log specifications may perform so well because they regress measures of size on size. For the second set of regressions, we eliminate size by scaling transaction values and estimated values by EBITDA in the year before the transaction. We then regress the resultant transaction value multiples on the estimated value multiples:

$$\text{Transaction Value Multiple} = \alpha + \beta \text{ Estimated Value Multiple} + \varepsilon \quad (6)$$

This specification is particularly attractive because, typically, the comparable estimates were calculated and HLT values were reported as multiples of EBITDA. (See Kaplan (1989b) and DeAngelo (1990)).

Table IV presents results of both log-log and level-level specifications for these scaled regressions. Again, we prefer the log-log specification because it assumes a more reasonable multiplicative error structure.[9] In Column 3, the estimates from the APV approaches explain from 33 percent to 43 percent of the variation in transaction multiples. The industry-based approach explains the most variation; the firm-based approach, the least. In contrast, the comparable company and comparable transaction multiples explain much less variation, at 22 percent and 9 percent, respectively. Although not reported, the comparable industry transaction multiples explain only 5 percent of the variation. Column 5 indicates that the industry-based and market-based APV approaches also explain more variation than both of the comparable approaches in the level-level specification.

While they explain an impressive amount of variation in transaction multiples, there is one respect in which the Compressed APV multiples (as well as the comparable company multiples) are disappointing. The constant terms in the regressions differ significantly from zero, and the slope coefficients differ significantly from one. All of the valuation methods tend to overvalue high multiple transactions and undervalue low multiple transactions. While the

[8] We do not present regressions using the comparable industry transaction estimated values because the regressions include only 38 observations and because those values explain less variation in transaction value than the other two comparable methods.

[9] We obtain economically and statistically similar results to the log-log specification when we regress the log of the transaction values on the log of the estimated values and the log of EBITDA.

comparable transaction method performs best on this dimension, it explains by far the least variation in transaction multiples.[10]

Overall, the univariate regression results indicate that the APV approaches perform well relative to the comparable approaches in explaining variation in transaction values and multiples. The APV approaches are individually superior to the comparable approaches in explaining the variation in transaction multiples. We interpret these results as additional evidence in favor of the usefulness of the discounted value approaches. Choosing among the three APV methods, the industry-based and market-based approaches outperform the firm-based approach in explaining variation in transaction values as they did in predicting the level of the transaction value.

The previous discussion compares the APV and comparable methods against each other. It is possible, however, that the different valuation approaches contain different information about transaction values. Accordingly, column 2 of Table IV presents estimates from a regression that includes the market-based Compressed APV values, the comparable company values, and comparable transaction values as independent variables in the original, nonscaled specification. All three variables are statistically significant, the intercept term is not significantly different from zero, and the variables together explain more variation in transaction value than any one of them does alone. We cannot reject the joint hypothesis that the intercept is zero and the sum of the slope coefficients equals one.

Columns 4 and 6 present the results of regressions that include the market-based APV multiples, the comparable company multiples, and the comparable transaction multiples in log-log and level-level specifications. The APV and comparable multiples together explain roughly 50 percent of the variation in transaction multiples. The coefficients indicate that the APV and comparable company methods both have significant explanatory power for transaction multiples. Although the comparable transaction multiple has the largest coefficient, that coefficient is not significant. Again, we cannot reject the joint hypothesis that the intercept is zero and the sum of the slope coefficients equals one.

[10] One possible explanation for the slope terms being less than one is that the constant term measures the contribution of EBITDA in explaining transaction value. This can be seen by multiplying equation (6) by EBITDA to recast the regression in levels:

$$\text{Transaction Value} = \alpha\ \text{EBITDA} + \beta\ \text{Estimated Value} + \varepsilon' \qquad (6')$$

If the estimated values are measured with some error, and EBITDA is correlated with the estimated values, α in equation (6) will not equal zero, and β will not equal one. We also estimated the reverse regressions in which the transaction value is the independent value and the estimated values are the dependent variables. In those regressions, only one slope coefficient in the APV estimate reverse regressions—that using the market-based APV values—differs significantly from one, at the 10 percent level, whereas the slope coefficients in all of the comparable estimate reverse regressions do. This explanation implies that the log-log value specification in equation (5) also should have measurement error. Consistent with this, the slope coefficients in reverse regressions of equation (5) tend to be closer to one than the slope coefficients in the forward regressions, even though most of the coefficients in both sets of regressions do not differ significantly from one.

The regression results in columns 2, 4, and 6 indicate that when feasible, it is worthwhile to combine the information in the APV and comparable approaches.

IV. Implied Cost of Capital

In this section, we revisit the risk premium that is used in our Compressed APV calculations. We devote special attention to the risk premium because there is substantial debate about how the risk premium should be measured. Some rely on the method we prefer which is a long-term arithmetic average of the historical return spread between a stock market index and riskless bonds—e.g., Brealey and Myers (1991). Others argue for a geometric average—e.g., Copeland, Koller, and Murrin (1990). These methods provide substantially different measures of risk premia. For example, the geometric average spread is 5.41 percent, which is roughly 2 percent below the median arithmetic average spread we use of 7.42 percent.

We invert our analysis to derive the discount rates implied by the transaction values to provide direct empirical evidence about the risk premium. We use the same forecast capital cash flows and terminal values to calculate an implied discount rate or cost of capital that equates the estimated value to the transaction value. The implied risk premium equals the difference between the implied discount rate and the yield on long-term Treasury bonds at the time of the projections. The implied risk premium represents the product of the implied market equity risk premium and an asset beta. We estimate an implied market equity risk premium by dividing the implied risk premium by our market-based asset beta (where the market-based asset beta is calculated using the value weighted capital structure for nonfinancial, nonutility firms in the S&P 500 in the fiscal year before the HLT announcement).

A. Implied Discount Rates, Risk Premia, and Market Equity Risk Premia

Using our assumption of 4 percent growth in calculating terminal values, Table V reports that the median implied discount rate for the 51 HLTs is 15.77 percent, the mean is 16.28 percent, and the standard deviation is 2.69 percent. The implied risk premium, calculated by subtracting the contemporaneous long-term Treasury bond yield, has a median of 7.08 percent, a mean of 7.14 percent, and a standard deviation of 2.87 percent. The median implied market equity risk premium is 7.78 percent, the mean is 7.97 percent, and the standard deviation is 3.30 percent. We do not find any variation over time in the implied market equity risk premia. Admittedly, such variation might be hard to detect, given the clustering of our sample in the late 1980s.

Table V also presents implied discount rates, risk premia, and market equity risk premia assuming terminal value growth rates of 6 percent, 2 percent, and 0 percent. Not surprisingly, the risk premia vary with the terminal value growth rate. The median implied market equity risk premium drops to 5.60 percent with no terminal value growth and increases to 9.03 percent with 6

Table V

Implied Discount Rates, Risk Premia, and Market Equity Risk Premia

Discount rates, risk premia, and market equity risk premia implied by projected capital cash flows in 51 highly leveraged transactions completed between 1983 and 1989. Terminal growth rate assumed to grow at 4, 6, 2, and 0 percent. The transaction value equals (1) the market value of the firm common stock; plus (2) the market value of firm preferred stock; plus (3) the value of the firm debt; plus (4) transaction fees; less (5) firm cash balances and marketable securities, all at the time of the transaction. Debt not repaid in the transaction is valued at book value; debt that is repaid, at repayment value. The implied discount rate discounts the capital cash flows to a value equal to the transaction value. The implied risk premium equals the difference between the implied discount rate and the yield on long-term Treasury bonds (from Ibbotson Associates) at the time of the projections. The implied market equity risk premium uses the value weighted capital structure for nonfinancial, nonutility firms in the S&P 500 in the fiscal year before the highly leveraged transaction announcement to transform the implied risk premium into the risk premium for an investment with a beta of one.

Terminal Value Growth Rate (%)	Median	Mean	Std. Dev.	Interquart. Range	Min.	Max.	*N*
Panel A: Implied Discount Rate							
4	15.77	16.28	2.69	3.06	10.37	24.16	51
6	16.77	17.32	2.64	2.80	11.55	25.39	51
2	14.85	15.29	2.75	3.24	9.29	23.16	51
0	13.79	14.36	2.83	3.50	8.29	22.46	51
Panel B. Implied Risk Premium							
4	7.08	7.14	2.87	2.76	0.90	15.85	51
6	8.16	8.18	2.84	2.42	2.08	16.98	51
2	5.82	6.16	2.93	2.93	−0.00	14.75	51
0	5.00	5.22	2.99	2.76	−1.26	14.02	51
Panel C. Implied Market Equity Risk Premium							
4	7.78	7.97	3.30	3.03	1.00	18.63	51
6	9.03	9.13	3.27	2.78	2.30	19.95	51
2	6.65	6.87	3.34	3.24	−0.02	17.34	51
0	5.60	5.83	3.41	3.05	−1.41	16.09	51

percent terminal value growth. As we noted earlier, we feel that a 4 percent growth rate is the economically most plausible assumption.

Like the evidence in Section III, the risk premium results strongly suggest that the Compressed APV technique works best when an arithmetic average risk premium is used. The estimated market equity risk premium of 7.78 percent is remarkably close to the (median 7.42 percent) long-term arithmetic average return spread between the S&P 500 index and long-term Treasury bonds that we use for our Compressed APV estimates. There is no evidence that the use of lower risk premia, however obtained, would improve the accuracy of discounted cash flow techniques.

B. Relation of Implied Risk Premia to Systematic Risk, Size, and Book-to-Market

In this section, we examine the relation between our implied risk premia and 1) firm asset betas; 2) industry asset betas; 3) transaction size; and 4) company book-to-market ratios (in the fiscal year ending before the transaction is announced). Our examination is motivated by two findings. First, Fama and French (1992) report that equity returns are negatively related to firm size, positively related to the book-to-market ratio, but unrelated to equity betas. Second, the results reported in Section III indicate that the Compressed APV method using market-based betas works about as well as industry-based and better than firm-based betas. Both of these results are contrary to the generally accepted notion that expected returns are related to systematic risk. By examining the determinants of the individual implied risk premia in our sample, we provide evidence on how the market determines expected returns. We use pre-transaction book-to-market ratios because at the time the transaction is completed, book-to-market ratios equal one for all management buyouts and are typically negative for recapitalizations. (The book-to-market analyses exclude observations with negative pretransaction book-to-market ratios.)

Table VI presents univariate regressions of the risk measures on the implied risk premium. The regressions indicate that the implied risk premium is positively related to both beta measures. In the two univariate regressions, however, neither of the coefficients on the betas is statistically significant at the 10 percent level. The insignificance of the regression coefficient for the industry beta appears to be caused by outliers. Nonparametric rank tests indicate that the risk premium is significantly related to industry betas (at the 10 percent level). We also find a significant relation—both parametrically and nonparametrically—between the implied risk premia and the original, levered industry equity betas.

While the risk premia are marginally related to industry betas, Table VI indicates that the implied risk premia are unrelated to firm size—(the log of) transaction value—or to the prebuyout book-to-market ratio. Nonparametric rank correlations also fail to identify any significant relation between the risk premium and either size or the book-to-market ratio.

The patterns are qualitatively similar when beta, size, and book-to-market ratios are included in the same regression. In fact, the firm asset beta becomes significant at the 10 percent level in the multiple regression. Overall, these results suggest a positive relationship between expected returns and systematic or beta risk, but provide no basis for concluding that discounted cash flow valuations could be improved by basing discount rates on firm size or market-to-book ratios.[11]

[11] Because the sample period precedes the Fama-French paper, it is possible to argue that the Fama-French factors do not matter because practitioners used the wrong discount rates. Although possible, we find this unpersuasive. After all, early tests of the CAPM used return data from periods that preceded the CAPM's formulation.

Table VI

Relation of Implied Risk Premium to Systematic Risk and Size

The implied risk premium is the risk premium implied by projected capital cash flows in 51 highly leveraged transactions (HLT) completed between 1983 and 1989. The terminal value is assumed to grow at 4 percent. The transaction value equals (1) the market value of the firm common stock; plus (2) the market value of firm preferred stock; plus (3) the value of the firm debt; plus (4) transaction fees; less (5) firm cash balances and marketable securities, all at the time of the transaction. Debt not repaid in the transaction is valued at book value; debt that is repaid, at the repayment value. The implied discount rate discounts the capital cash flows to a value equal to the transaction value. The implied risk premium equals the difference between the implied discount rate and the yield on long-term Treasury bonds at the time of the projections. Firm equity betas are calculated using the method in Dimson (1979). Firm asset betas are calculated using the firm equity, preferred, and debt betas, and preannouncement capital structures. Industry asset betas are calculated by applying the industry equity, preferred, and debt betas to the value-weighted capital structure for industry firms in the fiscal year before the HLT announcement. Industry-specific equity betas are calculated using value-weighted portfolio returns of firms in the same two-digit SIC code as the HLT firm. Equity betas are calculated over the period 540 to 60 trading days before the HLT announcement. For all calculations, preferred stock and debt betas are assumed equal to 0.25. Log size equals the log of the transaction value. Book-to-market is the ratio of company book value of equity plus deferred taxes to the market value of equity in the year ending before the transaction.

	Dependent Variable is Implied Risk Premium (in %)					
Constant	6.00*	5.90*	7.55*	6.80*	4.62***	6.03**
	(1.16)	(2.13)	(2.16)	(0.59)	(2.48)	(2.97)
Firm asset beta	1.36				2.26***	
	(1.31)				(1.28)	
Industry asset beta (portfolio-based)		1.48				0.23
		(2.49)				(2.67)
Log size			−0.06		0.04	0.08
			(0.32)		(0.32)	(0.34)
Book-to-market				0.40	0.43	0.44
				(0.61)	(0.63)	(0.65)
R^2	0.021	0.007	0.001	0.009	0.076	0.011
N	51	51	51	48	48	48

*, **, and *** denote significant difference from zero at the 1, 5, and 10 percent level, respectively.

V. Potential Endogeneity or Hardwiring of Cash Flow Forecasts

The previous sections indicate that the Compressed APV valuation approaches provide reasonably accurate estimates of transaction values. This is somewhat surprising because the high levels of debt in HLTs provide significant valuation challenges. The success of the Compressed APV approaches in valuing these complex HLTs raises the question of whether there is something special about our sample of HLTs that makes the Compressed APV technique so effective, and whether there are reasons to doubt that the APV methods will work as well in practice as they do in our tests.

The primary concern is that the cash flows might somehow be endogenous, and that the endogeneity causes the Compressed APV valuations to be spurious estimates of transaction value. One potential source of endogeneity is that dealmakers and managers in the HLTs in our sample may have had incentives to adjust the cash flow forecasts.[12] If the transaction value and financial structure are determined by competition in the market for corporate control, dealmakers may have an incentive to construct their cash flow forecasts to justify the price and to convince lenders and investors to finance the transactions. The transaction value and financial structure imply a sequence of required interest and principal payments, and the forecast cash flows have to exceed those debt payments for the transaction to be feasible. Because the sample transactions are largely debt financed (a median 88 percent of transaction value), cash flows that are constructed to exceed debt payments would be "hardwired" in the sense that cash flows are constructed so that their present value will yield the transaction value.

One implication of hardwiring is that the cash flow forecasts are adjusted upward or downward to approximate the required debt payments. Incentives to bias the cash flow forecasts upward may occur when true expected cash flows are below the level required to obtain financing. Incentives to bias the cash flows downward may occur when the true expected cash flows are substantially in excess of those required to obtain financing. Because the SEC and courts require the HLT firm's board of directors to obtain an opinion from an investment bank that the transaction value is "fair," insiders and dealmakers may have an incentive to reduce their reported cash flow forecasts to justify the transaction value.

As an illustration of hardwiring, consider a typical HLT that finances 55 percent of transaction value with bank debt at a nominal rate that exceeds the Treasury bond rate by 1.5 percent; approximately 35 percent of transaction value with subordinated debt at a nominal rate that exceeds the Treasury bond rate by 4.5 percent; and approximately 10 percent of transaction value with equity at an unknown rate of return over the Treasury bond. Assuming that equity yields a nominal return at least 4.5 percent over the Treasury bond, hardwiring would put a lower bound on the internal rate of return equal to the Treasury bond yield plus 2.85 percent.

The Treasury bond yield plus 2.85 percent is substantially below the implied discount rate (the Treasury bond yield plus 7.08 percent) that we estimate in Section IV, suggesting that our basic empirical findings are not confounded by hardwiring. Furthermore, hardwiring implies that all parties—investors, courts, investment banks, etc.—use methods like Compressed APV to determine the transaction value. Although we doubt that the Compressed APV

[12] For example, although it is not in our sample, there is some evidence that the managers at Interco made such adjustments during the financing of their leveraged recapitalization. See Jereski (1991). See also Burrough and Helyar (1990) for a description of how cash flows were forecast in the RJR Nabisco buyout.

method works simply because everyone uses it, we take the hardwiring criticism seriously and perform four sets of tests for evidence of hardwiring.

A. Ex post Accuracy of Cash Flow Forecasts

If the forecast cash flows are biased either upward or downward, there should be differences between the forecasts and the realizations. This is difficult to test because we know of no method to directly measure the ex ante bias, if any, in the forecasts. We rely, therefore, on ex post data to gauge the accuracy of the forecasts. Using ex post data to assess the forecasts is, however, complicated because the U.S. economy entered a recession in 1990, less than two years after the majority of these transactions. The forecasts were unlikely to anticipate the recession and thus, even if the forecasts were unbiased ex ante estimates of expected cash flows, we anticipate that the forecasts will exceed the actual cash flows. Nevertheless, we examine the ex post accuracy of the projections by comparing forecast EBITDA to post-transaction EBITDA. We also examine EBITDA margins—the ratio of EBITDA to sales—because the recession as well as asset sales not considered in the projections should have had less effect on margins.

We are able to obtain at least one year of post-transaction data for 46 of the 51 sample HLTs. In the first and second complete fiscal years after the HLT, EBITDA levels are, respectively, a median of 3.7 percent and 14.4 percent below those forecast, both of which are statistically significant at the 5 percent level. This is consistent with optimistic cash flow forecasts caused by either ex ante optimism or an unanticipated recession. In contrast, we find only weak evidence that forecast EBITDA margins are biased. EBITDA margins are below those forecast by a median of 3.2 percent and 3.6 percent of the forecast margin, respectively, in the first and second years after the transaction. (If EBITDA margins were forecast to equal 20.0 percent of sales, a 3.6 percent shortfall in margins is equivalent to actual margins being 19.3 percent of sales.) The shortfall in the first year is statistically insignificant, while the second year shortfall is significant only at the 10 percent level. The EBITDA and EBITDA margin shortfalls are also smaller than those documented in Kaplan (1989a) for an earlier sample of management buyouts. Overall, therefore, there is some evidence of optimistic EBITDA forecasts. But the closeness of the forecast and realized EBITDA margins suggests that at least some of the difference between forecast and actual EBITDA is related to the unanticipated recession instead of an ex ante bias.

B. Leverage

If cash flows forecasts are hardwired to repay debt, the hardwiring effect and the accuracy of the Compressed APV approaches should be more pronounced in more highly leveraged transactions. We test this implication of hardwiring by dividing the sample into firms that have above- and below-median post-transaction leverage (i.e., debt to transaction value). If hardwiring is causing

our results, the Compressed APV techniques should be more accurate for the high debt subsample.

Using the market-based APV approach, the mean absolute error for the lower debt sample is 17.1 percent of transaction value compared to 16.7 percent for the higher debt sample; and the mean squared error for the lower debt sample is 5.07 percent compared to 5.17 percent for the higher debt sample. Furthermore, the Compressed APV estimates (as multiples of EBITDA) for the lower debt sample explain more variation in (log) transaction multiples than the estimates for the higher debt sample—46 percent of the variation versus 28 percent. The only evidence consistent with the hardwiring explanation is that estimated values are within 15 percent of transaction value for 52 percent of the low debt sub-sample and 65 percent of the high debt sub-sample. And even this difference is not significant. Overall, these results do not provide much evidence for hardwiring.

C. Initial Public Offerings

In this section, we again test the hardwiring implication that the Compressed APV approaches should be less accurate for less highly-leveraged companies by estimating the value of firms in initial public offerings.

The IPOs are also particularly interesting because the incentives to hardwire the forecasts in IPOs are different from those in HLTs. We have noted that there may be incentives in HLTs to bias cash flows upward—to obtain financing—or to bias cash flows downward—to obtain a fairness opinion. In the IPOs in our sample, there are similar incentives to raise forecasts, *but—unlike HLTs—there are no incentives to lower forecasts*. The key difference is that the forecasts for the IPOs were provided to banks as part of the process of refinancing the HLT bank loans, but were not made available to equity investors. Unlike HLTs, if managers of an IPO firm believe future cash flows are going to be very strong, they do not require a fairness opinion and, therefore, have no incentive to present cash flow forecasts that are lower than they believe. Like HLTs, however, managers of an IPO firm might have an incentive to present cash flow forecasts that are higher than they believe in order to ensure financing and potentially get a higher IPO valuation. If hardwiring and associated incentives are causing spurious results in our HLT sample, the Compressed APV techniques should be higher and less accurate for the IPOs.

We obtained detailed cash flow forecasts for eight IPOs completed between October 1991 and July 1992. The IPOs all involved refinancing of existing debt because the eight issuers were companies that had previously completed highly leveraged transactions. We calculate the transaction value using the closing stock price on the day of the IPO.[13] Based on this price, the median

[13] By using the closing stock price, we avoid any bias that might be introduced by underpricing. This is probably a nonissue for this sample because the equity underpricing is very small—a median of 0.5 percent and an average of 2.3 percent.

Table VII

CAPM-based Approach with Market Betas for Initial Public Offering Sample

Valuation errors in 8 initial public offerings (IPOs) completed in 1991 and 1992. Valuation errors equal the natural log of estimated present value of projected capital cash flows relative to transaction value (in percent). Values are presented by terminal growth rate assumptions. Annual capital cash flows equal net income + depreciation + change in deferred taxes + amortization + (cash and noncash) interest − capital expenditures − increase in net working capital + after-tax proceeds of asset sales. Discount rates equal the yield on long-term Treasury bonds at the time of the projections plus a risk premium equal to the market asset beta times 7.31 percent (the arithmetic average premium of the S&P 500 return over the long-term Treasury bond return from 1926 until 1991). The market asset beta is calculated by applying a market equity beta of one to the value weighted capital structure for all non-financial, non-utility firms in the fiscal year before the IPO announcement. The transaction value equals (1) the market value of the firm common stock; plus (2) the market value of firm preferred stock; plus (3) the value of the firm debt; plus (4) transaction fees; less (5) firm cash balances and marketable securities, all at the time of the transaction. Debt not repaid in the transaction is valued at book value; debt that is repaid, at the repayment value. Valuation errors (in percent).

Terminal Value Growth Rate (%)	Median (%)	Mean (%)	Std. Dev. (%)	Interquart. Range (%)	Percentage within 0.15 (%)	Mean Absolute Error (%)	*N*
4	7.8	16.2	29.5	51.5	50.0	24.8	8
6	21.0	30.6	29.8	49.9	25.0	32.8	8
2	−2.2	5.3	29.4	52.0	37.5	23.0	8
0	−10.0	−3.5	29.4	50.3	37.5	24.9	8

post-IPO leverage ratio of 52.6 percent is appreciably lower than the 87.9 percent for the sample HLTs.

Table VII presents the results using the market-based APV approach with terminal value growth rates of 4 percent, 6 percent, 2 percent, and 0 percent. As with the HLT sample, we focus on the results using the 4 percent terminal value growth rate. Because expected inflation was arguably lower in 1991 and 1992 than in the earlier HLT period, however, we also discuss the results for the 2 percent growth rate.

Although the sample is small, the APV approach still performs fairly well. The median APV is 7.8 percent greater than firm value at a 4 percent terminal value growth rate, and 2.2 percent less than firm value at a 2 percent terminal value growth rate. The APV estimates are within 15 percent of firm value in 50.0 percent of the IPOs using 4 percent terminal value growth (and 37.5 percent of the IPOs using a 2 percent terminal value growth). Although this is less often than for the HLTs, such performance is as good as the comparable company and comparable transaction performance for the HLTs. Finally, the APV estimates for the IPOs explain 36 percent of the variation in (log) value multiples, or approximately as much of the variation in HLT transaction value multiples that the DCF estimates explained. Again, we do not believe these results provide much evidence for hardwiring.

D. Contested and Uncontested HLTs

Incentives to raise a cash flow forecast to justify a transaction ought to be higher when there are other bidders or some other form of outside pressure. In such situations, the failure to finance and complete the HLT both increases the likelihood that incumbent managers will lose their jobs (to the winning bidder) and ensures that dealmakers will lose their transaction fees. This suggests that in transactions that involve multiple bidders or hostile pressure, forecast cash flows ought to be higher relative to true "expected" cash flows. If this is the case, ex post performance relative to the forecasts ought to be lower. One might also argue that the APV estimates ought to be closer to the transaction values—i.e., have smaller MAEs and MSEs—when there is hostile pressure. We find little support for these two hypotheses.

In our sample, 18 firms explicitly received competing bids and 6 additional firms experienced hostile pressure in the form of block share purchases by outside parties for a total of 24 firms with some form of outside pressure. There was no overt outside pressure for 27 transactions. The valuation errors are insignificantly different across the two subsamples. Using a market-based APV approach (with 4 percent terminal value growth), the median APV estimate is 4.0 percent above the transaction value (mean is 1.3 percent) when there is outside pressure, and 0.6 percent below the transaction value (mean is 4.7 percent) when there is not. The Compressed APV estimates are more accurate, but insignificantly so, when there is outside pressure. For example, the mean absolute error for the outside pressure sample is 14.9 percent compared to 18.7 percent for the nonhostile sample. Also, 62.5 percent of the outside pressure APV estimates are within 15 percent of transaction value compared to 55.6 percent of the APV estimates with no outside pressure.

Most importantly, when we compare the ex post performance of the two subsamples of HLTs to the cash flow forecasts, we find no significant differences in EBITDA or EBITDA margins. In the first and second post-transaction years, respectively, EBITDA levels are a median of 9.5 percent and 13.6 percent below those forecast for the outside pressure transactions, and 2.8 percent and 20.5 percent below those forecast for the transactions with no outside pressure. Similarly, EBITDA margins are a median of 6.1 percent and 2.6 percent below those forecast for the outside pressure transactions, and 2.0 percent and 4.6 percent below those forecast for the transactions with no outside pressure. Again, we do not believe these results provide much evidence for hardwiring.

E. Discussion

None of the four sets of tests provide much evidence for the predictions of hardwiring. In our view, there is no reason to believe that the reliability of the Compressed APV methods is spurious. However, without ex ante evidence that the cash flow forecasts are actually an estimate of expected cash flows, we cannot completely eliminate the possibility that dealmakers systematically and materially adjusted their cash flow forecasts. While there may have been

other pressures or incentives that we have not examined, we have shown that the most obvious (at least to us) possible biases in the forecasts do not receive strong support from our data.

There are several reasons that adjustments to cash flows, especially larger ones, are costly. First, most of the dealmakers and investors in a particular HLT could expect to meet again in a future transaction. There were undoubtedly some reputational incentives not to present fictional forecasts. Second, in transactions that ultimately fail, creditors can sue insiders under fraudulent conveyance law if the original transaction rendered the company insolvent (solvency test) or the company had unreasonably small capital, i.e., insufficient forecast cash flow to meet debt payments (capital test). Both tests rely on the cash flow forecasts made at the time of the transaction. Courts and their examiners in fraudulent conveyance hearings have paid careful attention to whether the cash flow forecasts were "reasonable." (See Baird (1991) for a description of fraudulent conveyance law.) The failure of the Interco recapitalization received such an unusual amount of attention precisely because the cash flow forecasts were considered to have been unreasonable.

Furthermore, academic and anecdotal evidence suggest that bankers and buyout specialists took the cash flow forecasts seriously. Anders (1992) writes that the projections "took on a stature that was both awesome and terrifying to top executives. Unlike budgets that executives devised, the bank-book projections were ironclad." (Denis and Denis (1993) provide quantitative evidence that firms in recapitalizations were constrained by such budgets.) At a minimum, managers could expect that failure to meet those projections would bring increased scrutiny and pressure from banks and investors. To the extent that missed projections are followed by missed debt payments, equity investors could expect to lose their investment and managers could expect to lose their investment and their jobs.

It is, of course, *possible* that the Compressed APV methods succeed because all market participants were making the same mistakes. In particular, mistakenly high forecast cash flows may have mapped well into mistakenly high transaction values. (Kaplan and Stein (1993) present evidence consistent with the HLT market having overheated during the sample period.) There are two reasons that we are less concerned by this possibility. First, even if everyone were mistaken, it would not alter the fact that the Compressed APV methods are relatively successful and useful in predicting contemporaneous market values. Second, the roughly similar success of the Compressed APV methods in predicting IPO market values during a very different period supports the general reliability of those methods.

VI. Summary

This study provides evidence that discounted cash flow valuation methods provide reliable estimates of market value. Our median estimates of discounted cash flows for 51 HLTs are within 10 percent of the market values of the completed transactions and perform at least as well as valuation ap-

proaches using companies in similar industries and companies involved in similar transactions. We stress that our estimates rely on a number of ad hoc assumptions that readers (both academics and practitioners) should be able to improve on. We would expect such improvements to bring the DCF valuations even closer to the transaction values.

We use three CAPM-based approaches to estimate discount rates corresponding to firm-level, industry-level, and market-level measures of risk. All three methods perform well compared to those using comparable transactions and companies. Under what we consider the most realistic assumptions, the industry- and market-based approaches perform best. Although the DCF approaches perform at least as well as the comparable-based approaches, we find that the comparable-based estimates add explanatory power to the DCF-based estimates. Accordingly, we would recommend using information from both types of approaches in practical valuation settings where comparable values are available.

In the second part of this article, we use the forecast cash flows and transaction values to calculate implied discount rates and risk premia. The median implied market equity risk premium, the amount by which the return on the equity market exceeds the long-term Treasury bond yield, equals 7.78 percent. This accords well with the historical risk premium by which returns on the S&P 500 have exceeded Treasury bond returns. The relations between the implied risk premia and both firm and industry betas are positive and marginally significant. In contrast, there are no apparent relations between the implied risk premia and either transaction value, i.e., firm size, or book-to-market ratios. For this sample, therefore, the results favor CAPM-based approaches to discount rates over those based on size or book-to-market ratios.

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